

# The Ministry of Health, Labour and Welfare Ministerial Notification No. 285

Pursuant to Paragraph 1, Article 41 of the Pharmaceutical Affairs Law (Law No. 145, 1960), the Japanese Pharmacopoeia (hereinafter referred to as “new Pharmacopoeia”), which has been established as follows\*, shall be applied on April 1, 2006, and the Ministry of Health, Labour and Welfare Ministerial Notification No. 111 (Matter of Establishing the Japanese Pharmacopoeia; hereinafter referred to as “previous Pharmacopoeia”), issued in 2001, shall be abolished on March 31, 2006. However, in the case of drugs which are listed in the new Pharmacopoeia (limited to those listed in the previous Pharmacopoeia) and drugs which have been approved as of April 1, 2006 as prescribed under Paragraph 1, Article 14 of the same law [including drugs the Minister of Health, Labour and Welfare specifies (the Ministry of Health and Welfare Ministerial Notification No. 104, 1994) as those exempted from marketing approval pursuant to Paragraph 1, Article 14 of the Pharmaceutical Affairs Law (hereinafter referred to as “drugs exempted from approval”)], the Name and Standards established in the previous Pharmacopoeia (limited to part of the Name and Standards for the drugs concerned) may be accepted to conform to the Name and Standards established in the new Pharmacopoeia before and on September 30, 2007. In the case of drugs which are listed in the new Pharmacopoeia (excluding those listed in the previous Pharmacopoeia) and drugs which have been approved as of April 1, 2006 as prescribed under Paragraph 1, Article 14 of the same law (including those exempted from approval), they may be accepted as those being not listed in the new Pharmacopoeia before and on September 30, 2007.

**Jiro Kawasaki**

The Minister of Health, Labour and Welfare

March 31, 2006

Referring the next title to this book: “The Japanese Pharmacopoeia”.

(The text referred to by the term “as follows” are omitted here. All of them are made available for public exhibition at the Evaluation and Licensing Division, Pharmaceutical and Food Safety Bureau, Ministry of Health, Labour and Welfare, at each Regional Bureau of Health and Welfare, and at each Prefectural Office in Japan).

\*The term “as follows” here indicates the contents of the Japanese Pharmacopoeia Fifteenth Edition from General Notices to Ultraviolet-visible Reference Spectra (pp. 1 - 1654).

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# PREFACE

The 14th Edition of the Japanese Pharmacopoeia (JP) was promulgated by Ministerial Notification No. 111 of the Ministry of Health, Labour and Welfare (MHLW) on March 30, 2001. To keep pace with progress in medical and pharmaceutical sciences, in November 2001, the Committee on JP established the basic principles for the preparation of the JP 15th Edition, setting out the characteristics and roles of the JP, the definite measures for the revision, the date of the revision, and the organization of the JP expert committees.

At the above Committee, the five basic principles of JP, which we refer to as the “Five Pillars of JP” were established as follows.:

- 1) Making the JP more substantial by including all drugs which are important from the viewpoint of health care and medical treatment;
- 2) Making prompt partial revision as necessary and facilitating smooth administrative operation;
- 3) Promoting international harmonization;
- 4) Ensuring transparency regarding the revision and dissemination to the public of the JP;
- 5) Promoting the introduction of new analytical technology and appropriate modifications to existing science and technology, and promoting the improvement of reference standards.

It was agreed that the Committee on JP should make efforts, on the basis of the Five Pillars of JP, to ensure that the JP is used effectively in health care and medical treatment, by seeking the understanding and cooperation for interested parties.

The JP should provide an official standard, being required to assure the quality of medicines in Japan in response to the progress of science and technology and medical demands at the time. It should define the standards for specifications, as well as the methods of testing to assure the overall quality of every drug in principle, and it should have a role in clarifying the criteria for quality assurance of drugs that are recognized to be essential for public health and medical treatment.

The JP has been prepared with the aid of the knowledge and experience of many professionals in the pharmaceutical field. Therefore, JP should have the characteristics of an official standard, which might be widely used by all parties concerned. It should provide information and understanding about the quality of drugs to the public, and it should be conducive to

smooth and effective regulatory control of the quality of drugs, as well as promoting and maintaining international consistency and harmonization of technical requirements.

It was also agreed that JP articles should cover drugs which are important from the viewpoint of health care and medical treatment based on demand, frequency of use and clinical results. It should ensure prompt pharmacopoeial listing after the introduction of drugs to the market.

A definite rule for selection of articles and a clarification of criteria for selection were also established. The rule was described by the Pharmaceutical Affairs and Food Sanitation Council (PAFSC) in an article entitled “What the future Japanese Pharmacopoeia should be” on December 2002. The target date for the publication of JP 15th Edition (the Japanese edition) was set as April 2006.

At the first stage, JP Expert Committees were organized into the following twelve Panels and two sub-committees: Panel on the Principles of Revisions; Panel on the Selection of Articles; Panel on Nomenclature; Panel on Pharmaceutical Excipients; First Panel on Chemical Drugs, Second Panel on Chemical Drugs; Panel on Biologicals; Panel on Biological Tests; Panel on Physico-Chemical Methods; Panel on Physical Methods; Panel on Preparations; Panel on Crude Drugs; First Sub-committee on the Principles of Revisions; First Sub-committee on Crude Drugs.

In November 2001, the JP Expert Committees were reorganized into the following eleven Panels in accordance with the recommendation of the PAFSC: Panel on the Principles of Revisions; Panel on Nomenclature; Panel on Pharmaceutical Excipients; Panel on Physico-Chemical Methods; Panel on Medicinal Chemicals; Panel on Biologicals; Panel on Biological Tests; Panel on Antibiotics; Panel on Crude Drugs; Sub-committee on the Principles of Revisions; Panel on International Harmonization (Pharmacopoeial Discussion Group (PDG) related Panel). Thereafter, the Panel on Pharmaceutical Water, Panel on Reference Standards, and three working groups under the Panel on Medicinal Chemicals were established to expedite discussion of revision drafts of Monographs.

In the Committee on JP, Mitsuru Uchiyama took the role of chairman from January 2001 to December 2002, Tadao Terao from January to June 2003, and Takao Hayakawa from July 2003 to March 2006.

In addition to the regular revision every five years in line with the basic principles for the preparation of the JP, it was agreed that partial revision should be done as necessary to take account of recent progress of science and in the interests of international harmonization.

In accordance with the above principles, the expert committees initiated deliberations on selection of articles, and revisions for General Notices, General Rules for Preparations, General Tests, Monographs and so on.

Draft revisions covering subjects, the addition to General Notices of a sentence “In principle, unless otherwise specified, animals used as a source of materials for preparing pharmaceutical preparations must be healthy” and the deletion of a monograph “Phenacetin” were examined by the Committee on JP in November 2001, followed by the PAFSC in December 2001, and then submitted to the MHLW.

The revision was promulgated on March 29, 2002 by Ministerial Notification No.151 of the MHLW.

For draft revisions covering subjects in General Notices, General Rules for Preparations, General Rules for Crude Drugs, General Tests and Monographs, deliberations were continued between June 2000 and February 2002, prepared for a supplement to the JP 14, examined by the Committee on JP in September 2002, followed by the PAFSC in December 2002, and then submitted to the Minister of MHLW. The supplement was named “Supplement I to the JP 14th Edition” and promulgated on December 27, 2002 by Ministerial Notification No. 395 of MHLW.

The numbers of meetings in the above process to prepare the supplement drafts were as follows: Panel on the Principles of Revisions (6 times); Panel on the Selection of Articles (2); Panel on Nomenclature (11); Panel on Pharmaceutical Excipients (10); First Committee on Chemical Drugs (10); Second Committee on Chemical Drugs (16); Committee on Biologicals (8); Committee on Biological Methods (9); Committee on Physico-Chemical Methods (8); Committee on Physical Methods (8); Committee on Pharmaceutical Preparations (5); Committee on Crude Drugs (6); First Sub-committee on the Principles of Revisions (27); First Sub-committee on Crude Drugs (7). The numbers of meetings of newly reorganized Panels were as follows, Panel on Nomenclature (2), Panel on Physico-Chemical Methods (1), Panel on Crude Drugs (3), and Sub-panel on the Principles of Revisions (1).

In consequence of the above revision, the JP 14th Edition with Supplement I carries 881 articles in Part I, including 31 articles newly added and 8 articles deleted; and 481 articles in Part II, including 15 articles newly added and 3 articles deleted. It should be noted that in the preparation of the drafts for the Supplement I,

generous cooperation was given by the Technical Committee of the Pharmaceutical Manufacturer’s Association of Osaka (OPMA) and of Tokyo (PMAT), the Tokyo Crude Drugs Association (TCDA), the Japan Pharmaceutical Excipients Council (JPEC), the Japan Kampo Medicine Manufacturers’ Association (JKMA), the Japan Antibiotics Research Association (JARA), the Japan Flavor and Fragrance Materials Association (JFFMA), the Japan Medical Plants Federation (JMPF), the Japan Pharmaceutical Manufacturers Association (JPMA), the Japanese Society of Hospital Pharmacists (JSHP), the Japan Pharmaceutical Association (JPA), and the Japan Oilseeds Processors Association (JOPA).

Draft revisions covering subjects in General Rules for Preparations, General Tests and Monographs, for which discussions were completed between March 2002 and December 2003, were prepared for a supplement to the JP 14. They were examined by the Committee on JP in September 2004, followed by the PAFSC in December 2004, and then submitted to the Minister of Health, Labour and Welfare.

The supplement was named “Supplement II to the JP 14th Edition” and promulgated on December 28, 2004 by Ministerial Notification No.461 of MHLW.

The numbers of meetings in the expert committees to prepare the supplement drafts were as follows: Panel on the Principles of Revisions (9); Panel on Nomenclature (10); Panel on Pharmaceutical Excipients (11); Panel on Physico-Chemical Methods (30); Panel on Medicinal Chemicals (containing the WG) (24); Panel on Biologicals (11); Panel on Biological Tests (10); Panel on Antibiotics (19); Committee on Crude Drugs (19); Sub-panel on the Principles of Revisions (12); Panel on International Harmonization (PDG related Panel) (9); Panel on Pharmaceutical Water (2); Panel on Reference Standards (3).

In consequence of this revision, the JP 14th Edition including the Supplement I and II carries 907 articles in Part I, including 27 articles newly added and 1 article deleted; and 484 articles in Part II, including 12 articles newly added and 9 articles deleted. It should be noted that in the preparation of the drafts for the Supplement II, generous cooperation was given by the Technical Committee of OPMA and PMAT, TCDA, JPEC, JKMA, JARA, JFFMA, JMPF, JPMA, JSHP, JPA, and JOPA.

Draft revisions covering subjects, the addition to General Notices of a sentence “The items in General Test, Monographs (excipients) or General Information in JP, which reflect text signed-off by all three pharmacopoeias, JP, EP and USP (referred to as “the signed-off item”), are stated at the front”, the addition of a test to General Tests “Test for Extractable Volume

of Parenteral Preparations” and the revisions in General Notices for Preparations and Monographs due to the addition of the test, were examined by the Committee on JP in June 2005, followed by the PAFSC, and then submitted to the Minister MHLW.

The revision was promulgated on July 21, 2005 by Ministerial Notification No. 344 of MHLW.

Draft revisions covering subjects in General Notices, General Rules for Crude Drugs, General Rules for Preparations, General Tests and Monographs, for which discussions were finished between January 2004 and August 2005, were decided as a supplement to the JP 15. They were examined by the Committee on JP in October 2005, followed by the PAFSC in December 2005, and then submitted to the Minister of MHLW.

The numbers of meetings in the expert committees to prepare the supplement drafts were as follows: Panel on the Principles of Revisions (2); Panel on Nomenclature (2); Panel on Pharmaceutical Excipients (3); Panel on Physico-Chemical Methods (6); Panel on Medicinal Chemicals (including the working groups) (17); Panel on Biologicals (3); Panel on Biological Tests (2); Panel on Antibiotics (6); Panel on Crude Drugs (6); Panel on International Harmonization (PDG) (2); Panel on Pharmaceutical Water (2); Panel on Reference Standards (2).

In April 2004, the Pharmaceuticals and Medical Devices Agency (PMDA) was established, and a part of the organization for JP preparation was moved from MHLW to PMDA. Since July 2004, the numbers of discussions in the expert committees to prepare the supplement drafts were as follows: Panel on the Principles of Revisions (6); Panel on International Harmonization (PDG related)(3); Panel on Pharmaceutical Water (7); Panel on Reference Standards (4); Panel on Physico-Chemical Methods (6); Panel on Drug Formulation (7); Panel on Physical Methods (9); Panel on Medicinal Chemicals (containing the WG) (32); Panel on Biologicals (6); Panel on Antibiotics (9); Panel on Biological Tests (6); Panel on Crude Drugs (12); Panel on Nomenclature (8); Panel on Pharmaceutical Excipients (7). It should be noted that in the preparation of the drafts for the supplement, generous cooperation was given by OPMA and PMAT, TCDA, JPEC, JKMA, JARA, JFMA, JMPF, JPMA, ISHP, JPA, and JOPA.

In consequence of this revision, the JP 15th Edition carries 1483 articles, owing to the addition of 102 articles and the deletion of 8 articles.

The principles of description and the salient points of the revision in this volume are as follows:

1. The JP 15th Edition comprises the following items, in order: Notification of MHLW; Contents;

Preface; General Notices; General Rules for Crude Drugs; General Rules for Preparations; General Tests, Processes and Apparatus; Official Monographs; then followed by Infrared Reference Spectra; Ultraviolet-visual Reference Spectra; General Information; Table of Atomic Mass as an appendix; and a Cumulative Index.

2. The articles in General Rules for Preparations, Official Monographs, Infrared Reference Spectra Official and Ultraviolet-visible Reference Spectra are respectively placed in alphabetical order.

3. The following items in each monograph are put in the order shown below, except that unnecessary items are omitted depending on the nature of the drug:

- (1) English title
- (2) Commonly used name(s)
- (3) Latin title (only for crude drugs)
- (4) Title in Japanese
- (5) Structural formula or empirical formula
- (6) Molecular formula and molecular mass
- (7) Chemical name
- (8) Origin
- (9) Limits of the content of the ingredient(s) and/or the unit of potency
- (10) Labeling requirements
- (11) Method of preparation
- (12) Description/Description of crude drugs
- (13) Identification tests
- (14) Specific physical and/or chemical values
- (15) Purity tests
- (16) Loss on drying, loss on ignition, and/or water
- (17) Residue on ignition, total ash, and/or acid-insoluble ash
- (18) Tests being required for pharmaceutical preparations and other special tests
- (19) Isomer ratio
- (20) Assay or the content of the ingredient(s)
- (21) Containers and storage
- (22) Expiration date
- (23) Others

4. In each monograph, the following physical and chemical values representing the properties and quality of the drug are given in the order indicated below, except that unnecessary items are omitted depending on the nature of the drug:

- (1) Alcohol number
- (2) Absorbance
- (3) Congealing point
- (4) Refractive index
- (5) Osmolarity
- (6) Optical rotation
- (7) Viscosity

- (8) pH
- (9) Specific gravity
- (10) Boiling point
- (11) Melting point
- (12) Acid value
- (13) Saponification value
- (14) Ester value
- (15) Hydroxyl value
- (16) Iodine value

5. Identification tests comprise the following items, which are generally put in the order given below:

- (1) Coloration reactions
- (2) Precipitation reactions
- (3) Decomposition reactions
- (4) Derivatives
- (5) Visible, ultraviolet or infrared spectra
- (6) Special reactions
- (7) Cations
- (8) Anions

6. Purity tests comprise the following items, which are generally put in the order given below, except that unnecessary items are omitted depending on the nature of the drug:

- (1) Color
- (2) Odor
- (3) Clarity and/or color of solution
- (4) Acidity or alkalinity
- (5) Acidity
- (6) Alkalinity
- (7) Chloride
- (8) Sulfate
- (9) Sulfite
- (10) Nitrate
- (11) Nitrite
- (12) Carbonate
- (13) Bromide
- (14) Iodide
- (15) Soluble halide
- (16) Thiocyanide
- (17) Selenium
- (18) Cationic salts
- (19) Ammonium
- (20) Heavy metals
- (21) Iron
- (22) Manganese
- (23) Chromium
- (24) Bismuth
- (25) Tin
- (26) Aluminum
- (27) Zinc
- (28) Cadmium
- (29) Mercury
- (30) Copper

- (31) Lead
- (32) Silver
- (33) Alkaline earth metals
- (34) Arsenic
- (35) Foreign matter
- (36) Related substances
- (37) Residual solvent
- (38) Other mixtures
- (39) Readily carbonizable substances

7. In accordance with the deletion of the prescription on composition of JP by the Pharmaceutical Affairs Law, the composition of Official Monographs was prescribed in General Notices.

8. The following items in General Notices were revised:

- (1) The criteria for conformity of drugs by Description tests in monograph was defined by paragraph 5.
- (2) The atomic mass table used for JP was changed to the Standard Atomic Weights 2004 by paragraph 8.
- (3) A provision “the temperature used for the tests or in storage is described, in principle, in specific figures” was added by paragraph 15.
- (4) The containers of well-closed, tight and hermetic were defined by paragraphs 38, 39 and 40, respectively.
- (5) Renumbering for paragraph, and other rearrangements were done.

9. The following items of the General Rules for Preparations were revised:

- (1) General Notices for Preparations
- (2) Extracts
- (3) Capsules
- (4) Transdermal Systems (newly added)
- (5) Tablets
- (6) Injections
- (7) Plasters and Pressure Sensitive Adhesives Tapes
- (8) Arrangements for others

10. The provision of the criteria for conformity of crude drugs was revised by paragraphs 4 and 5 of General Rules for Crude Drugs.

11. In the General Tests, Processes and Apparatus, “Content Uniformity Tests” and “Mass Variation Tests” were combined and renamed as “Uniformity of Dosage Units”.

12. The following items of the General Tests, Processes and Apparatus were revised:

- (1) Ammonium Limit Test
- (2) Arsenic Limit Test
- (3) Boiling Point and Distilling Range Test

- (4) Crude Drugs Test
- (5) Disintegration Test
- (6) Dissolution Test
- (7) Insoluble Particulate Matter Test for Injections
- (8) Melting Point Determination
- (9) Microbial Assay for Antibiotics
- (10) Microbial Limit Test for Crude Drugs
- (11) Powder Particle Size Determination
- (12) Residue on Ignition Test
- (13) Specific Surface Area Determination
- (14) Test Methods for Plastic Containers

13. The following items of the General Tests, Processes and Apparatus were deleted:

- (1) Absorbance Ratio Method
- (2) Methoxyl Assay
- (3) Paper Chromatography
- (4) Volatile Contaminations in Ethanol

14. The following Reference Standards were newly added:

Cilostazol  
 Ethyl Icosapentate  
 Ginsenoside Rb<sub>1</sub>  
 Ginsenoside Rg<sub>1</sub>  
 Gonadorelin Acetate  
 Human Menopausal Gonadotrophin  
 Interleukin-2  
 Isoflurane  
 Limaprost  
 Low-molecular Mass Heparin  
 Melting Point Standard (Acetanilide)  
 Melting Point Standard (Acetophenetidin)  
 Melting Point Standard (Caffeine)  
 Melting Point Standard (Sulfanilamide)  
 Melting Point Standard (Sulfapyridine)  
 Melting Point Standard (Vanillin)  
 Methylergometrine Maleate  
 Oxytocin  
 Phytonadione  
 Pravastatin 1,1,3,3-Tetramethylbutylammonium  
 Ritodrine Hydrochloride  
 Roxatidine Acetate Hydrochloride  
 Vasopressin  
 Warfarin Potassium

15. The following Reference Standards were deleted.

Benzylpenicilline Sodium  
 Cefaloridin  
 Cefamandole Lithium  
 Cefetamet Pivoxil Hydrochloride  
 Cefoselis Sulfate  
 Cefoxitin  
 Cefradine

Posterior Pituitary  
 Secretin  
 Ticarcillin Sodium

16. English and Latin titles of drugs were based, in principle, on the International Nonproprietary Names for Pharmaceutical Substances, and the chemical names were based on the Rules of the International Union of Pure and Applied Chemistry (IUPAC).

17. Molecular formulas of organic compounds begin with C and then H, followed by other involved elements in the alphabetical order of the symbols of the elements.

18. Structural formulas of drugs represent, as far as possible, steric configurations.

19. The test procedures in monographs were written in full, except within the same monograph and in the monographs for preparations having a corresponding monograph of their principal material substances.

20. The following articles were newly added to Official Monographs:

Alacepril  
 Alacepril Tablets  
 Amphotericin B for Injection  
 Amphotericin B Syrup  
 Amphotericin B Tablets  
 Arbekacin Sulfate Injection  
 L-Arginine  
 L-Aspartic Acid  
 Atenolol  
 Benincasa Seed  
 Betahistine Mesilate Tablets  
 Betamethasone Tablets  
 Betamethasone Valerate and Gentamicin Sulfate Cream  
 Betamethasone Valerate and Gentamicin Sulfate Ointment  
 Bezafibrate  
 Bezafibrate Sustained Release Tablets  
 Bucillamine  
 Cefaclor Capsules  
 Cefaclor Compound Granules  
 Cefaclor Fine Granules  
 Cefcapene Pivoxil Hydrochloride Fine Granules  
 Cefcapene Pivoxil Hydrochloride Tablets  
 Cefdinir Capsules  
 Cefdinir Fine Granules  
 Cefditoren Pivoxil Fine Granules  
 Cefditoren Pivoxil Tablets  
 Cefotiam Hydrochloride for Injection  
 Cefozopran Hydrochloride for Injection



- Cefteram Pivoxil Fine Granules  
 Celmoleukin (Genetical Recombination)  
 Chenodeoxycholic Acid  
 Cilastatin Sodium  
 Cilostazol  
 Cilostazol Tablets  
 Clarithromycin Tablets  
 Clindamycin Hydrochloride Capsules  
 Croscarmellose Sodium  
 Daiokanzoto Extract  
 Dolichos Seed  
 Doxifluridine  
 Doxifluridine Capsules  
 Eleutherococcus Senticosus Rhizome  
 Ethyl Icosapentate  
 Etidronate Disodium  
 Etidronate Disodium Tablets  
 Etodolac  
 Faropenem Sodium for Syrup  
 Faropenem Sodium Tablets  
 Fosfomycin Sodium for Injection  
 Gonadorelin Acetate  
 Haloperidol Tablets  
 Hochuekkito Extract  
 Human Menopausal Gonadotrophin  
 Idarubicin Hydrochloride for Injection  
 Imipenem and Cilastatin for Injection  
 Isoflurane  
 Kakkonto Extract  
 Kamishoyosan Extract  
 Limaprost Alfadex  
 Lisinopril Hydrate  
 Lisinopril Tablets  
 Mefloquine Hydrochloride  
 Metformin Hydrochloride  
 Metformin Hydrochloride Tablets  
 Metoprolol Tartrate  
 Metoprolol Tartrate Tablets  
 Metronidazole Tablets  
 Nelumbo Seed  
 Nicergoline  
 Nicergoline Powder  
 Nicergoline Tablets  
 Nitrendipine  
 Nitrendipine Tablets  
 Parnaparin Sodium  
 Piperacillin Sodium for Injection  
 Polygonatum Rhizome  
 Pravastatin Sodium  
 Propranolol Hydrochloride Tablets  
 Pullulan  
 Rifampicin Capsules  
 Ritodrine Hydrochloride  
 Ritodrine Hydrochloride Tablets  
 Roxatidine Acetate Hydrochloride  
 Roxatidine Acetate Hydrochloride Extended-release Capsules  
 Ryokeijutsukanto Extract  
 Saccharin  
 Saireito Extract  
 Sulpiride Capsules  
 Sulpiride Tablets  
 Tamsulosin Hydrochloride  
 Taurine  
 Teceleukin (Genetical Recombination)  
 Teceleukin for Injection (Genetical Recombination)  
 Timolol Maleate  
 Trimetazidine Hydrochloride Tablets  
 Urapidil  
 Vancomycin Hydrochloride for Injection  
 Verapamil Hydrochloride Tablets  
 Voglibose  
 Voglibose Tablets  
 Zaltoprofen  
 Zaltoprofen Tablets
- 21.** The following monographs were revised:
- Achyranthes Root  
 Aclarubicin Hydrochloride  
 Acrinol Hydrate  
 Actinomycin D  
 Akebia Stem  
 Alisma Rhizome  
 Powdered Alisma Rhizome  
 Alprostadil Alfadex  
 Amikacin Sulfate  
 Amomum Seed  
 Powder Amomum Seed  
 Amoxicillin Hydrate  
 Amphotericin B  
 Ampicillin Hydrate  
 Anhydrous Ampicillin  
 Ampicillin Sodium  
 Arbekacin Sulfate  
 L-Arginine Hydrochloride  
 Asiasarum Root  
 Aspoxicillin Hydrate  
 Astragalus Root  
 Astromicin Sulfate  
 Atractylodes Lancea Rhizome  
 Powdered Atractylodes Lancea Rhizome  
 Aztreonam  
 Bacitracin  
 Bekanamycin Sulfate  
 Benidipine Hydrochloride Tablets  
 Benzyl Alcohol  
 Benzylpenicillin Potassium  
 Berberine Tannate

Betahistine Mesilate  
Betamethasone  
Bethanechol Chloride  
Bleomycin Hydrochloride  
Bleomycin Sulfate  
Bromazepam  
Bupleurum Root  
Burdock Fruit  
Butyl Parahydroxybenzoate  
Calcium Gluconate Hydrate  
Calcium Para-aminosalicylate Granules  
Calcium Para-aminosalicylate Hydrate  
L-Carbocysteine  
Carumonam Sodium  
Cefaclor  
Cefadroxil  
Cefalotin Sodium  
Cefatrizine Propylene Glycolate  
Cefazolin Sodium  
Cefazolin Sodium Hydrate  
Cefcapene Pivoxil Hydrochloride Hydrate  
Cefdinir  
Cefditoren Pivoxil  
Cefepime Dihydrochloride Hydrate  
Cefixime  
Cefmenoxime Hydrochloride  
Cefmetazole Sodium  
Cefminox Sodium Hydrate  
Cefotetan  
Cefotiam Hexetil Hydrochloride  
Cefotiam Hydrochloride  
Cefozopran Hydrochloride  
Cefpiramide Sodium  
Cefpodoxime Proxetil  
Cefroxadine Hydrate  
Cefsulodin Sodium  
Ceftazidime Hydrate  
Ceftibuten Hydrate  
Ceftizoxime Sodium  
Ceftriaxone Sodium Hydrate  
Cefuroxime Axetil  
Microcrystalline Cellulose  
Powdered Cellulose  
Chloramphenicol  
Chloramphenicol Palmitate  
Chlorpheniramine Maleate  
Chlorpheniramine Maleate Injection  
Chlorpheniramine Maleate Powder  
Chlorpheniramine Maleate Tablets  
*d*-Chlorpheniramine Maleate  
Chlorpromazine Hydrochloride Tablets  
Ciclacillin  
Cinnamon Bark  
Powdered Cinnamon Bark  
Anhydrous Citric Acid  
Citric Acid Hydrate  
Citrus Unshiu Peel  
Clindamycin Hydrochloride  
Clindamycin Phosphate  
Clove  
Cloxacillin Sodium Hydrate  
Colistin Sodium Methanesulfonate  
Colistin Sulfate  
Coptis Rhizome  
Powdered Coptis Rhizome  
Corn Starch  
Cornus Fruit  
Cortisone Acetate  
Cyanamide  
Cyanocobalamin  
Cyanocobalamin Injection  
Cycloserine  
Daunorubicin Hydrochloride  
Demethylchlortetracycline Hydrochloride  
Dexamethasone  
Dibekacin Sulfate  
Dicloxacillin Sodium Hydrate  
Dimercaprol  
Dimercaprol Injection  
Doxorubicin Hydrochloride  
Doxycycline Hydrochloride Hydrate  
Enflurane  
Enviomycin Sulfate  
Epirubicin Hydrochloride  
Erythromycin  
Erythromycin Ethylsuccinate  
Erythromycin Lactobionate  
Erythromycin Stearate  
Ethanol  
Anhydrous Ethanol  
Ethanol for Disinfection  
Ethyl Parahydroxybenzoate  
Etilefrine Hydrochloride  
Famotidine Powder  
Famotidine Tablets  
Faropenem Sodium Hydrate  
Powdered Fennel  
Flomoxef Sodium  
Flopropione Capsules  
Foeniculated Ammonia Spirit  
Fosfomycin Sodium  
Fradiomycin Sulfate  
Gardenia Fruit  
Gentamicin Sulfate  
Ginger  
Powdered Ginger  
Ginseng  
Powdered Ginseng

Glycyrrhiza  
Powdered Glycyrrhiza  
Griseofulvin  
Haloperidol  
Hemp Fruit  
Idarubicin Hydrochloride  
Imipenem Hydrate  
Insulin  
Insulin Human (Genetical Recombination)  
Insulin Injection  
Insulin Zinc Injection (Aqueous Suspension)  
Insulin Zinc Protamine Injection (Aqueous Suspension)  
Isophane Insulin Injection (Aqueous Suspension)  
Amorphous Insulin Zinc Injection (Aqueous Suspension)  
Crystalline Insulin Zinc Injection (Aqueous Suspension)  
Isepamicin Sulfate  
Japanese Angelica Root  
Powdered Japanese Angelica Root  
Josamycin  
Josamycin Propionate  
Jujube  
Jujube Seed  
Kanamycin Monosulfate  
Kanamycin Sulfate  
Ketoprofen  
Kitasamycin  
Kitasamycin Acetate  
Kitasamycin Tartrate  
Lactose Hydrate  
Anhydrous Lactose  
Latamoxef Sodium  
Lenampicillin Hydrochloride  
Lincomycin Hydrochloride Hydrate  
Loquat Leaf  
Meropenem Hydrate  
Methylcellulose  
Methylergometrine Maleate  
Methylergometrine Maleate Tablets  
Methyl Parahydroxybenzoate  
Metronidazole  
Micronomicin Sulfate  
Midecamycin  
Midecamycin Acetate  
Minocycline Hydrochloride  
Mitomycin C  
Moutan Bark  
Powdered Moutan Bark  
Mupirocin Calcium Hydrate  
Nalidixic Acid  
Netilmicin Sulfate  
Nicotinamide  
Nystatin  
Ophiopogon Tuber  
Oxytetracycline Hydrochloride  
Oxytocin  
Oxytocin Injection  
Panipenem  
Powdered Peach Kernel  
Peony Root  
Powdered Peony Root  
Peplomycin Sulfate  
Perilla Herb  
Phellodendron Bark  
Powdered Phellodendron Bark  
Phenethicillin Potassium  
Phytonadione  
Pimaricin  
Pinellia Tuber  
Pirarubicin  
Pivmecillinam Hydrochloride  
Plantago Seed  
Platycodon Root  
Powdered Platycodon Root  
Polygala Root  
Powdered Polygala Root  
Polymixin B Sulfate  
Poria Sclerotium  
Powdered Poria Sclerotium  
Potassium Clavulanate  
Potato Starch  
Povidone  
Processed Aconite Root  
Powdered Processed Aconite Root  
Propranolol Hydrochloride  
Propyl Parahydroxybenzoate  
Pueraria Root  
Pyrrolnitrin  
Red Ginseng  
Rehmannia Root  
Rhubarb  
Powdered Rhubarb  
Ribostamycin Sulfate  
Rifampicin  
Rokitamycin  
Roxithromycin  
Saccharin Sodium Hydrate  
Safflower  
Santonin  
Schisandra Fruit  
Scutellaria Root  
Powdered Scutellaria Root  
Senna Leaf  
Powdered Senna Leaf  
Siccantin  
Sisomicin Sulfate

Sodium Citrate Hydrate  
 Sodium Fusidate  
 Spectinomycin Hydrochloride Hydrate  
 Spiramycin Acetate  
 Streptomycin Sulfate  
 Sulbenicillin Sodium  
 Sulpiride  
 Swertia Herb  
 Talampicillin Hydrochloride  
 Teicoplanin  
 Tetracycline Hydrochloride  
 Tobramycin  
 Tranexamic Acid Capsules  
 Tranexamic Acid Tablets  
 Trichomycin  
 Trichosanthes Root  
 Trimetazidine Hydrochloride  
 Uncaria Hook  
 Vancomycin Hydrochloride  
 Vasopressin Injection  
 Warfarin Potassium  
 Water  
 Water for Injection  
 Purified Water  
 Sterile Purified Water  
 Wine  
 Wheat Starch  
 Zinostatin Stimalamer

22. The following monographs were revised in Japanese titles:

Acebutolol Hydrochloride  
 Acetylcholine Chloride for Injection  
 Acetylspiramycin  
 Aclarubicin Hydrochloride  
 Acrinol Hydrate  
 Adrenaline  
 Adrenaline Injection  
 Adrenaline Solution  
 Alimemazine Tartrate  
 Alprenolol Hydrochloride  
 Aluminum Potassium Sulfate Hydrate  
 Amantadine Hydrochloride  
 Ambenonium Chloride  
 Amikacin Sulfate  
 Aminophylline Hydrate  
 Amitriptyline Hydrochloride  
 Amitriptyline Hydrochloride Tablets  
 Amoxicillin Hydrate  
 Ampicillin Hydrate  
 Arbekacin Sulfate  
 L-Arginine Hydrochloride  
 L-Arginine Hydrochloride Injection  
 Arotinolol Hydrochloride

Aspoxicillin Hydrate  
 Astromicin Sulfate  
 Atropine Sulfate Hydrate  
 Atropine Sulfate Injection  
 Bacampicillin Hydrochloride  
 Bamethan Sulfate  
 Beclometasone Dipropionate  
 Bekanamycin Sulfate  
 Benidipine Hydrochloride  
 Benidipine Hydrochloride Tablets  
 Benserazide Hydrochloride  
 Benzalkonium Chloride  
 Benzalkonium Chloride Concentrated Solution 50  
 Benzalkonium Chloride Solution  
 Benzethonium Chloride  
 Benzethonium Chloride Solution  
 Benzylpenicillin Benzathine Hydrate  
 Berberine Chloride Hydrate  
 Betahistine Mesilate  
 Betamethasone Dipropionate  
 Betamethasone Sodium Phosphate  
 Betamethasone Valerate  
 Bethanechol Chloride  
 Biperiden Hydrochloride  
 Bleomycin Hydrochloride  
 Bleomycin Sulfate  
 Bromhexine Hydrochloride  
 Bromocriptine Mesilate  
 Bromovalerylurea  
 Bucumolol Hydrochloride  
 Bufetolol Hydrochloride  
 Bufexamac Cream  
 Bunazosin Hydrochloride  
 Bupranolol Hydrochloride  
 Butropium Bromide  
 Caffeine Hydrate  
 Calcium Chloride Hydrate  
 Calcium Gluconate Hydrate  
 Calcium Lactate Hydrate  
 Calcium Para-aminosalicylate Hydrate  
 Camostat Mesilate  
 Carbazochrome Sodium Sulfonate Hydrate  
 Carbidopa Hydrate  
 Carteolol Hydrochloride  
 Cefcapene Pivoxil Hydrochloride Hydrate  
 Cefepime Dihydrochloride for Injection  
 Cefepime Dihydrochloride Hydrate  
 Cefmenoxime Hydrochloride  
 Cefminox Sodium Hydrate  
 Cefotiam Hexetil Hydrochloride  
 Cefotiam Hydrochloride  
 Cefozopran Hydrochloride  
 Cefpirome Sulfate  
 Cefpodoxime Proxetil

Cefroxadine Hydrate  
 Ceftazidime Hydrate  
 Cefteram Pivoxil  
 Ceftibuten Hydrate  
 Ceftriaxone Sodium Hydrate  
 Cefuroxime Axetil  
 Cellacefate  
 Cetraxate Hydrochloride  
 Chloramphenicol Palmitate  
 Chloramphenicol Sodium Succinate  
 Chlorhexidine Gluconate Solution  
 Chlorhexidine Hydrochloride  
 Chlormadinone Acetate  
 Chlorphenesin Carbamate  
 Chlorpheniramine Maleate  
 Chlorpheniramine Maleate Injection  
 Chlorpheniramine Maleate Powder  
 Chlorpheniramine Maleate Tablets  
*d*-Chlorpheniramine Maleate  
 Chlorpromazine Hydrochloride  
 Chlorpromazine Hydrochloride Injection  
 Chlorpromazine Hydrochloride Tablets  
 Citric Acid Hydrate  
 Clemastine Fumarate  
 Clindamycin Hydrochloride  
 Clindamycin Phosphate  
 Clocapramine Hydrochloride Hydrate  
 Clofedanol Hydrochloride  
 Clomifene Citrate  
 Clomifene Citrate Tablets  
 Clomipramine Hydrochloride  
 Clonidine Hydrochloride  
 Cloperastine Hydrochloride  
 Cloxacillin Sodium Hydrate  
 Cocaine Hydrochloride  
 Codeine Phosphate Hydrate  
 1% Codeine Phosphate Powder  
 10% Codeine Phosphate Powder  
 Codeine Phosphate Tablets  
 Colistin Sulfate  
 Cortisone Acetate  
 Croconazole Hydrochloride  
 Cyclopentolate Hydrochloride  
 Cyclophosphamide Hydrate  
 Cyproheptadine Hydrochloride Hydrate  
 Dantrolene Sodium Hydrate  
 Daunorubicin Hydrochloride  
 Deferoxamine Mesilate  
 Demethylchlortetracycline Hydrochloride  
 Dextromethorphan Hydrobromide Hydrate  
 Dibasic Calcium Phosphate Hydrate  
 Dibasic Sodium Phosphate Hydrate  
 Dibekacin Sulfate  
 Dibucaine Hydrochloride  
 Dicloxacillin Sodium Hydrate  
 Diethylcarbamazine Citrate  
 Diethylcarbamazine Citrate Tablets  
 Difenidol Hydrochloride  
 Dihydrocodeine Phosphate  
 1% Dihydrocodeine Phosphate Powder  
 10% Dihydrocodeine Phosphate Powder  
 Dihydroergotamine Mesilate  
 Dihydroergotoxine Mesilate  
 Dilazep Hydrochloride Hydrate  
 Diltiazem Hydrochloride  
 Dimemorfan Phosphate  
 Diphenhydramine and Bromovalerylurea Powder  
 Diphenhydramine Hydrochloride  
 Disodium Edetate Hydrate  
 Distigmine Bromide  
 Distigmine Bromide Tablets  
 Dobutamine Hydrochloride  
 Dopamine Hydrochloride  
 Dopamine Hydrochloride Injection  
 Doxapram Hydrochloride Hydrate  
 Doxorubicin Hydrochloride  
 Doxycycline Hydrochloride Hydrate  
 Ecothiopate Iodide  
 Edrophonium Chloride  
 Edrophonium Chloride Injection  
 Enoxacin Hydrate  
 Enviomycin Sulfate  
 Eperisone Hydrochloride  
 Ephedrine Hydrochloride  
 Ephedrine Hydrochloride Injection  
 10% Ephedrine Hydrochloride Powder  
 Ephedrine Hydrochloride Tablets  
 Epirubicin Hydrochloride  
 Ergometrine Maleate  
 Ergometrine Maleate Injection  
 Ergometrine Maleate Tablets  
 Ergotamine Tartrate  
 Erythromycin Ethylsuccinate  
 Erythromycin Lactobionate  
 Erythromycin Stearate  
 Estradiol Benzoate  
 Estradiol Benzoate Injection  
 Estradiol Benzoate Injection (Aqueous Suspension)  
 Ethambutol Hydrochloride  
 Ethyl L-Cysteine Hydrochloride  
 Ethylmorphine Hydrochloride Hydrate  
 Etilefrine Hydrochloride  
 Etilefrine Hydrochloride Tablets  
 Faropenem Sodium Hydrate  
 Fentanyl Citrate  
 Ferrous Sulfate Hydrate  
 Flavoxate Hydrochloride  
 Fluphenazine Enanthate

Flurazepam Hydrochloride  
 Formoterol Fumarate Hydrate  
 Fosfomycin Calcium Hydrate  
 Fradiomycin Sulfate  
 Fursultiamine Hydrochloride  
 Gabexate Mesilate  
 Gentamicin Sulfate  
 Guanabenz Acetate  
 Guanethidine Sulfate  
 Homatropine Hydrobromide  
 Homochlorcyclizine Hydrochloride  
 Human Chorionic Gonadotrophin  
 Human Chorionic Gonadotrophin for Injection  
 Hydralazine Hydrochloride  
 Hydralazine Hydrochloride for Injection  
 Hydralazine Hydrochloride Powder  
 Hydralazine Hydrochloride Tablets  
 Hydrocortisone Acetate  
 Hydrocortisone Butyrate  
 Hydrocortisone Sodium Phosphate  
 Hydrocortisone Sodium Succinate  
 Hydrocortisone Succinate  
 Hydrocotarnine Hydrochloride Hydrate  
 Hydroxocobalamin Acetate  
 Hypromellose Phthalate  
 Hydroxyzine Hydrochloride  
 Hydroxyzine Pamoate  
 Idarubicin Hydrochloride  
 Ifenprodil Tartrate  
 Imipenem Hydrate  
 Imipramine Hydrochloride  
 Imipramine Hydrochloride Tablets  
 Indenolol Hydrochloride  
 Ipratropium Bromide Hydrate  
 Isepamicin Sulfate  
*l*-Isoprenaline Hydrochloride  
 Josamycin Propionate  
 Kainic Acid Hydrate  
 Kanamycin Monosulfate  
 Kanamycin Sulfate  
 Ketamine Hydrochloride  
 Ketotifen Fumarate  
 Kitasamycin Acetate  
 Kitasamycin Tartrate  
 Lactose Hydrate  
 Lenampicillin Hydrochloride  
 Levallorphan Tartrate  
 Levallorphan Tartrate Injection  
 Levomepromazine Maleate  
 Levothyroxine Sodium Hydrate  
 Lincomycin Hydrochloride Hydrate  
 Loxoprofen Sodium Hydrate  
*L*-Lysine Hydrochloride  
 Lysozyme Hydrochloride  
 Magnesium Sulfate Hydrate  
 Maltose Hydrate  
 Maprotiline Hydrochloride  
 Meclofenoxate Hydrochloride  
 Mepenzolate Bromide  
 Mepivacaine Hydrochloride  
 Mepivacaine Hydrochloride Injection  
 Mercaptopurine Hydrate  
 Meropenem Hydrate  
 Metenolone Acetate  
 Metenolone Enanthate  
 Metenolone Enanthate Injection  
 Methamphetamine Hydrochloride  
 Methylbenactyzium Bromide  
 Methyldopa Hydrate  
*dl*-Methylephedrine Hydrochloride  
 10% *dl*-Methylephedrine Hydrochloride Powder  
 Methylergometrine Maleate  
 Methylergometrine Maleate Tablets  
 Methylprednisolone Succinate  
 Methylrosanilinium Chloride  
 Mexiletine Hydrochloride  
 Miconazole Nitrate  
 Micronomicin Sulfate  
 Midecamycin Acetate  
 Minocycline Hydrochloride  
 Monobasic Calcium Phosphate Hydrate  
 Morphine Hydrochloride Hydrate  
 Morphine Hydrochloride Injection  
 Morphine Hydrochloride Tablets  
 Mupirocin Calcium Hydrate  
 Naloxone Hydrochloride  
 Naphazoline Hydrochloride  
 Naphazoline Nitrate  
 Neostigmine Methylsulfate  
 Neostigmine Methylsulfate Injection  
 Netilmicin Sulfate  
 Nicardipine Hydrochloride  
 Nicardipine Hydrochloride Injection  
 Noradrenaline  
 Noradrenaline Injection  
 Nortriptyline Hydrochloride  
 Noscapine Hydrochloride Hydrate  
 Opium Alkaloids Hydrochlorides  
 Opium Alkaloids Hydrochlorides Injection  
 Orciprenaline Sulfate  
 Oxapium Iodide  
 Oxprenolol Hydrochloride  
 Oxybuprocaine Hydrochloride  
 Oxycodone Hydrochloride Hydrate  
 Oxytetracycline Hydrochloride  
 Pancuronium Bromide  
 Papaverine Hydrochloride  
 Papaverine Hydrochloride Injection

Penbutolol Sulfate  
Pentoxifyverine Citrate  
Peplomycin Sulfate  
Perphenazine Maleate  
Perphenazine Maleate Tablets  
Pethidine Hydrochloride  
Pethidine Hydrochloride Injection  
Phenylephrine Hydrochloride  
Pilocarpine Hydrochloride  
Pipemidic Acid Hydrate  
Piperazine Adipate  
Piperazine Phosphate Hydrate  
Piperazine Phosphate Tablets  
Pirenzepine Hydrochloride Hydrate  
Pivmecillinam Hydrochloride  
Polymixin B Sulfate  
Prednisolone Acetate  
Prednisolone Sodium Succinate for Injection  
Prednisolone Succinate  
Procainamide Hydrochloride  
Procainamide Hydrochloride Injection  
Procainamide Hydrochloride Tablets  
Procaine Hydrochloride  
Procaine Hydrochloride Injection  
Procarbazine Hydrochloride  
Procaterol Hydrochloride Hydrate  
Prochlorperazine Maleate  
Prochlorperazine Maleate Tablets  
Promethazine Hydrochloride  
Propantheline Bromide  
Propranolol Hydrochloride  
Protamine Sulfate  
Protamine Sulfate Injection  
Protirelin Tartrate Hydrate  
Pyrantel Pamoate  
Pyridostigmine Bromide  
Pyridoxine Hydrochloride  
Pyridoxine Hydrochloride Injection  
Quinidine Sulfate Hydrate  
Quinine Ethyl Carbonate  
Quinine Hydrochloride Hydrate  
Quinine Sulfate Hydrate  
Ranitidine Hydrochloride  
Retinol Acetate  
Retinol Palmitate  
Riboflavin Butyrate  
Riboflavin Sodium Phosphate  
Riboflavin Sodium Phosphate Injection  
Ribostamycin Sulfate  
Saccharin Sodium Hydrate  
Salbutamol Sulfate  
Scopolamine Butylbromide  
Scopolamine Hydrobromide Hydrate  
Sisomicin Sulfate  
Sodium Acetate Hydrate  
Sodium Carbonate Hydrate  
Sodium Citrate Hydrate  
Sodium Picosulfate Hydrate  
Sodium Prasterone Sulfate Hydrate  
Sodium Thiosulfate Hydrate  
Sorbitan Sesquioleate  
Spectinomycin Hydrochloride Hydrate  
Streptomycin Sulfate  
Sucralfate Hydrate  
Sulfamonomethoxine Hydrate  
Sulpyrine Hydrate  
Sultamicillin Tosilate Hydrate  
Suxamethonium Chloride for Injection  
Suxamethonium Chloride Hydrate  
Suxamethonium Chloride Injection  
Talampicillin Hydrochloride  
Terbutaline Sulfate  
Testosterone Enanthate  
Testosterone Enanthate Injection  
Testosterone Propionate  
Testosterone Propionate Injection  
Tetracaine Hydrochloride  
Tetracycline Hydrochloride  
Thiamine Chloride Hydrochloride  
Thiamine Chloride Hydrochloride Injection  
Thiamine Chloride Hydrochloride Powder  
Thiamine Nitrate  
Thioridazine Hydrochloride  
Tiaramide Hydrochloride  
Tiaramide Hydrochloride Tablets  
Ticlopidine Hydrochloride  
Timepidium Bromide Hydrate  
Tipepidine Hibenstate  
Tipepidine Hibenstate Tablets  
Tizanidine Hydrochloride  
Tocopherol Acetate  
Tocopherol Calcium Succinate  
Tocopherol Nicotinate  
Todralazine Hydrochloride Hydrate  
Tolperisone Hydrochloride  
Trihexyphenidyl Hydrochloride  
Trihexyphenidyl Hydrochloride Tablets  
Trimebutine Maleate  
Trimetazidine Hydrochloride  
Trimetoquinol Hydrochloride Hydrate  
Tubocurarine Chloride Hydrochloride Hydrate  
Tubocurarine Chloride Hydrochloride Injection  
Tulobuterol Hydrochloride  
Vancomycin Hydrochloride  
Verapamil Hydrochloride  
Vinblastine Sulfate  
Vinblastine Sulfate for Injection  
Vincristine Sulfate

## Zinc Sulfate Hydrate

23. The following three monographs in the JP 14th Edition were replaced by a new monograph “Hympromellose”, and were deleted due to this revision:

Hydroxypropylmethylcellulose 2208  
Hydroxypropylmethylcellulose 2906  
Hydroxypropylmethylcellulose 2910

24. The following monographs were deleted:

Cefaloridine  
Cefamandole Sodium  
Cefetamet Pivoxil Hydrochloride  
Cefoselis Sulfate  
Cefoxitin Sodium  
Cefradine  
Secretin  
Ticarcillin Sodium

Those who were engaged in the preparation of the JP 15th Edition are as follows:

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Nobuo Aoyagi**	Mitsuo Ito
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Keiko Arimoto	Takashi Itoh
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Hiroto Miyamoto	Shinji Sugaya
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Motohiro Nishijima	Kiyoshi Tomioka
Tatsumi Nishiyama	Motowo Tomita
Takashi Nomoto	Tatsuru Tomizawa
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# GENERAL NOTICES

1. The official name of this pharmacopoeia is 第十五改正日本薬局方, and may be abbreviated as 日局十五, 日局15, JP XV or JP 15.

2. The English name of this pharmacopoeia is The Japanese Pharmacopoeia, Fifteenth Edition.

3. Among drugs, the Japanese Pharmacopoeia Drugs (the JP Drugs) are those specified in the monographs. The title names and the commonly used names adopted in the monographs should be used as official names. The distinction of the preparations name of Fine Granules and Powders follows according to the definition in the section of “Powders” of General Rules for Preparations. In the drug monographs, in addition to English name, chemical names or Latin names can be mentioned in the titles, as appropriate.

4. “Crude Drugs and related drugs” are placed together in the posterior part of the Official Monographs. These include: Crude Drugs being applied the requirements of the General Rules for Crude Drugs, or Powders, Extracts, Tinctures, Syrups, Spirits, Lini-ments or Suppositories containing Crude Drugs as the active ingredient, combination preparations containing Crude Drugs as the principal active ingredient.

5. Drugs are to be tested according to the provisions given in the pertinent monographs, General Notices, General Rules for Crude Drugs, General Rules for Preparations, and General Tests for their conformity to the Japanese Pharmacopoeia. However, the items of “Description” and “Storage” under Containers and storage in the monographs on preparations are given for information, and should not be taken as indicating standards for conformity.

6. In principle, unless otherwise specified, animals used for preparing the JP Drugs or their source materials must be healthy.

7. In this English version, the JP Drugs described in the monographs begin with a capital letter.

8. The molecular formulas or constitution formulas in parentheses ( ) after the name of drugs or chemicals designate chemically pure substances. Atomic masses adopted in the Japanese Pharmacopoeia conform to the table of “Standard Atomic Weights 2004”. Molecular masses are indicated to two decimal places rounded from three decimals.

9. The following abbreviations are used for the principal units.

meter	m
centimeter	cm
millimeter	mm
micrometer	$\mu\text{m}$
nanometer	nm
kilogram	kg
gram	g
milligram	mg
microgram	$\mu\text{g}$
nanogram	ng
picogram	pg
Celsius degree	$^{\circ}\text{C}$
square centimeter	$\text{cm}^2$
liter	L
milliliter	mL
microliter	$\mu\text{L}$
megahertz	MHz
per centimeter	$\text{cm}^{-1}$
newton	N
kilopascal	kPa
pascal	Pa
mole per liter	mol/L
millipascal second	$\text{mPa}\cdot\text{s}$
square millimeter second	$\text{mm}^2/\text{s}$
lux	lx
mass per cent	%
mass parts per million	ppm
mass parts per billion	ppb
volume per cent	vol%
volume parts per million	vol ppm
mass per volume per cent	w/v%
hydrogen ion concentration	pH
endotoxin unit	EU

Note: “ppm” used in the Nuclear Magnetic Resonance Spectroscopy indicates the chemical shift, and “w/v%” is used in the formula or composition of preparations.

10. The unit used for expressing the potency of drug is recognized as the quantity of drug. Usually it is expressed by a definite quantity of a definite standard substance which shows a definite biological activity, and differs according to each drug. The units are determined, in principle, by comparison with each reference standard by means of biological methods. The term “Unit” used for the JP articles indicates the unit defined in the Japanese Pharmacopoeia.

**11.** The statement “Being specified separately.” in the monographs means that the tests are to be specified when the drugs are granted approval based on the Pharmaceutical Affairs Law.

**12.** When an assurance that a product is of the JP Drug quality is obtained consistently from data derived from the manufacturing process validation studies, and from the records of appropriate manufacturing process control and of the test results of the quality control, some of the test items in the monograph being performed for the release of a product may be omitted as occasion demands.

**13.** The test methods specified in the Japanese Pharmacopoeia can be replaced by alternative methods which give better accuracy and precision. However, where a difference in test results is suspected, only the result obtained by the procedure given in the Pharmacopoeia is effective for the final judgment.

**14.** The details of the biological test methods may be changed insofar as they do not affect the essential qualities of the test.

**15.** The temperature for the tests or storage is described, in principle, in specific figures. However, the following expressions may be used instead.

Standard temperature, ordinary temperature, room temperature, and lukewarm are defined as 20°C, 15 – 25°C, 1 – 30°C, and 30 – 40°C, respectively. A cold place, unless otherwise specified, shall be a place having a temperature of 1 – 15°C.

The temperature of cold water, lukewarm water, warm water, and hot water are defined as not exceeding 10°C, 30 – 40°C, 60 – 70°C, and about 100°C, respectively.

The term “heated solvent” or “hot solvent” means a solvent heated almost to the boiling point of the solvent, and the term “warmed solvent” or “warm solvent” usually means a solvent heated to a temperature between 60°C and 70°C. The term “heat on or in a water bath” indicates, unless otherwise specified, heating with a boiling water bath or a steam bath at about 100°C.

Cold extraction and warm extraction are usually performed at temperatures of 15 – 25°C and 35 – 45°C, respectively.

**16.** To measure the number of drops, a dropping device which delivers 20 drops of Purified Water weighing 0.90 – 1.10 g at 20°C shall be used.

**17.** The term “in vacuum” indicates, unless otherwise specified, a pressure not exceeding 2.0 kPa.

**18.** The acidity or alkalinity of a solution, unless otherwise specified, is determined by blue or red litmus papers. To indicate these properties more precisely, pH values are used.

**19.** The terms in Table 1 are used to express the degree of cutting of Crude Drugs or fineness of powder Drugs.

**Table 1**

Sieve No.	4	6.5	8.6	18	50	100	200
Nominal Designation of sieve	4750 $\mu\text{m}$	2800 $\mu\text{m}$	2000 $\mu\text{m}$	850 $\mu\text{m}$	300 $\mu\text{m}$	150 $\mu\text{m}$	75 $\mu\text{m}$
Names of the drugs which pass through the respective sieves	Coarse cutting	Moderately fine cutting	Fine cutting	Coarse powder	Moderately fine powder	Fine powder	Very fine powder

**20.** Unless otherwise specified, the water to be used in the tests of drugs shall be Purified Water.

**21.** As for wording “solution of a solute”, where the name of the solvent is not stated, the term “solution” indicates a solution in water.

**22.** For solution an expression such as “(1 in 3)”, “(1 in 10)”, or “(1 in 100)” means that 1 g of a solid is dissolved in, or 1 mL of a liquid is diluted with the solvent to make the total volume of 3 mL, 10 mL or 100 mL, respectively. For the liquid mixture an expression such as “(10:1)” or “(5:3:1)” means that the respective numbers of parts, by volume, of the designated liquids are to be mixed.

**23.** The term “weigh accurately” means to weigh down to the degree of 0.1 mg, 0.01 mg or 0.001 mg by taking into account the purpose of the test and using a relevant weighing device. The term “weigh exactly” means to weigh to the given decimal places.

**24.** A value of “n” figures in a test of a JP Drug shall be obtained by rounding off a value of “n + 1” figures.

**25.** Unless otherwise specified, all tests of the drugs shall be performed at the ordinary temperature and observations of the results shall follow immediately after the operations. However, the judgment for a test which is affected by temperature should be based on the conditions at the standard temperature.

**26.** The terms “immediately”/“at once” used in the test of a JP Drug mean that the procedure is to be performed within 30 seconds after the preceding procedure.

**27.** In the section under the heading Description, the term “white” is used to indicate white or practically white, and “colorless” is colorless or practically colorless. Unless otherwise specified, the test of color is carried out by placing 1 g of a solid drug on a sheet of white paper or in a watch glass placed on white paper. A liquid drug is put into a colorless test tube of 15-mm internal diameter and is observed in front of a white

background through a layer of 30 mm. For the test of clarity of liquid drugs the same procedure is applied with either a black or white background. For the observation of fluorescence of a liquid drug, only a black background shall be used.

**28.** In the section under the heading Description, the term “odorless” is used to indicate odorless or practically odorless. Unless otherwise specified, the test of odor shall be carried out by placing 1 g of a solid drug or 1 mL of a liquid drug in a beaker.

**29.** In the section under the heading Description, solubilities are expressed by the terms in Table 2. Unless otherwise specified, solubility means the degree of dissolution of a JP Drug, previously powdered in the case of a solid drug, within 30 minutes in a solvent at  $20 \pm 5^\circ\text{C}$ , by vigorous shaking for 30 seconds each time at 5-minute intervals.

**Table 2**

Descriptive term	Volume of solvent required for dissolving 1 g or 1 mL of solute
Very soluble	Less than 1 mL
Freely soluble	From 1 mL to less than 10 mL
Soluble	From 10 mL to less than 30 mL
Sparingly soluble	From 30 mL to less than 100 mL
Slightly soluble	From 100 mL to less than 1000 mL
Very slightly soluble	From 1000 mL to less than 10000 mL
Practically insoluble, or insoluble	10000 mL and over

**30.** In the test of a drug, the term “dissolve” or “miscible” indicates that it dissolves in, or mixes in arbitrary proportion with the solvent to form a clear solution or mixture. Insoluble materials other than the drug including fibers should not be detected or practically invisible, if any.

**31.** Identification is the test necessary to identify the active ingredient(s) of the drug based upon its specific property.

**32.** Purity is the test to detect impurities/contaminants in drugs, and it, as well as other requirements in each monograph, specifies the purity of the drug usually by limiting the kind/nature and quantity of the impurities/contaminants. The impurities/contaminants subject to the purity test are those supposed to generate/contaminate during the manufacturing process or storage, including hazardous agents such as heavy metals, arsenic, etc. If any foreign substances are used or supposed to be added, it is necessary to perform tests to detect or limit the presence of such

substances.

**33.** The term “constant mass” in drying or ignition, unless otherwise specified, means that the mass difference after an additional 1 hour of drying or ignition is not more than 0.10% of the preceding mass of the dried substance or ignited residue. For crude drugs, the difference is not more than 0.25%. However, when the difference does not exceed 0.5 mg in a chemical balance, 0.05 mg in a semi-microbalance, or 0.005 mg in a microbalance, the difference is considered as negligible and constant mass has been attained.

**34.** Assay is the test to determine the composition, the content of the active ingredients, and the potency unit of medicine by physical, chemical or biological procedures.

**35.** In stating the appropriate quantities to be taken for assay, the use of the word “about” indicates a quantity within 10% of the specified mass. The word “dry” in respect of the sample indicates drying under the same conditions, as described in Loss on drying in the monograph.

**36.** For the content of an ingredient determined by Assay in the monographs, if it is expressed simply as “not less than a certain percentage” without indicating its upper limit, 101.0% is understood as the upper limit.

**37.** The container is the device which holds drugs. The stopper or cap, etc., is considered as part of the container. The containers have no physical and chemical reactivity affecting the specified description and quality of the contents.

**38.** A well-closed container protects the contents from extraneous solids and from loss of the drug under ordinary or customary conditions of handling, shipment, and storage.

Where a well-closed container is specified, it may be replaced by a tight container.

**39.** A tight container protects the contents from extraneous solids or liquids, from loss of the contents, and from efflorescence, deliquescence, or evaporation under ordinary or customary conditions of handling, shipment, and storage.

Where a tight container is specified, it may be replaced by a hermetic container.

**40.** A hermetic container is impervious to air or any other gas under ordinary or customary conditions of handling, shipment, and storage.

**41.** The term “light-resistant” means that it can prevent transmittance of light affecting in the specified properties and quality of the contents and protect the contained medicament from the light under ordinary or customary conditions of handling, shipment, and storage.

42. For the JP Drugs, the contents or potency in terms of units of the active ingredient(s), or the specified expiration date in the monographs have to be shown on the immediate container or wrapping of them.

43. The origin, numerical value or physical properties of the JP Drugs, being stipulated by the special labeling requirements in the monographs, have to be shown on the immediate container or wrapping of them.

44. The harmonized General Tests and Monographs among the Japanese Pharmacopoeia, the European Pharmacopoeia and the United States Pharmacopoeia are preceded by the statement as such.

The parts of the text, being not harmonized, are surrounded by the symbols (♦ ♦).

# GENERAL RULES FOR CRUDE DRUGS

1. Crude drugs in the monographs include medicinal parts obtained from plants or animals, cell inclusions and secretes separated from the origins, their extracts, and minerals. General Rules for Crude Drugs and Crude Drugs Test are applicable to the following:

Acacia, Achyranthes Root, Agar, Akebia Stem, Alisma Rhizome, Aloe, Alpinia Officinarum Rhizome, Amomum Seed, Anemarrhena Rhizome, Angelica Dahurica Root, Apricot Kernel, Areca, Artemisia Capillaris Flower, Asiasarum Root, Asparagus Tuber, Astragalus Root, Atractylodes Lancea Rhizome, Atractylodes Rhizome, Bear Bile, Bearberry Leaf, Belladonna Root, Benincasa Seed, Benzoin, Bitter Cardamon, Bitter Orange Peel, Bupleurum Root, Burdock Fruit, Calumba, Capsicum, Cardamon, Cassia Seed, Catalpa Fruit, Chrysanthemum Flower, Cimicifuga Rhizome, Cinnamon Bark, Citrus Unshiu Peel, Clematis Root, Clove, Cnidium Monnieri Fruit, Cnidium Rhizome, Coix Seed, Condurango, Coptis Rhizome, Cornus Fruit, Corydalis Tuber, Cyperus Rhizome, Digenea, Dioscorea Rhizome, Dolichos Seed, Eleutherococcus Senticosus Rhizome, Ephedra Herb, Epimedium Herb, Eucommia Bark, Evodia Fruit, Fennel, Forsythia Fruit, Fritillaria Bulb, Gambir, Gardenia Fruit, Gastrodia Tuber, Gentian, Geranium Herb, Ginger, Ginseng, Glehnia Root, Glycyrrhiza, Gypsum, Hemp Fruit, Honey, Houத்துynia Herb, Immature Orange, Imperata Rhizome, Ipecac, Japanese Angelica Root, Japanese Gentian, Japanese Valerian, Jujube, Jujube Seed, Lindera Root, Lithospermum Root, Longgu, Lonicera Leaf and Stem, Loquat Leaf, Lycium Bark, Lycium Fruit, Magnolia Bark, Magnolia Flower, Mallotus Bark, Mentha Herb, Moutan Bark, Mulberry Bark, Nelumbo Seed, Notopterygium Rhizome, Nuphar Rhizome, Nux Vomica, Ophiopogon Tuber, Oriental Bezoar, Oyster Shell, Panax Japonicus Rhizome, Peach Kernel, Peony Root, Perilla Herb, Pharbitis Seed, Phellodendron Bark, Picrasma Wood, Pinellia Tuber, Plantago Herb, Plantago Seed, Platycodon Root, Polygala Root, Polygonatum Rhizome, Polygonum Root, Polyporus Sclerotium, Poria Sclerotium, Powdered Acacia, Powdered Agar, Powdered Alisma Rhizome, Powdered Aloe, Powdered Amomum Seed, Powdered Atractylodes Lancea Rhizome, Powdered Atractylodes Rhizome, Powdered

Calumba, Powdered Capsicum, Powdered Cinnamon Bark, Powdered Clove, Powdered Cnidium Rhizome, Powdered Coix Seed, Powdered Coptis Rhizome, Powdered Cyperus Rhizome, Powdered Dioscorea Rhizome, Powdered Fennel, Powdered Gambir, Powdered Gardenia Fruit, Powdered Gentian, Powdered Geranium Herb, Powdered Ginger, Powdered Ginseng, Powdered Glycyrrhiza, Powdered Ipecac, Powdered Japanese Angelica Root, Powdered Japanese Gentian, Powdered Japanese Valerian, Powdered Magnolia Bark, Powdered Moutan Bark, Powdered Oyster Shell, Powdered Panax Japonicus Rhizome, Powdered Peach Kernel, Powdered Peony Root, Powdered Phellodendron Bark, Powdered Picrasma Wood, Powdered Platycodon Root, Powdered Polygala Root, Powdered Polyporus Sclerotium, Powdered Poria Sclerotium, Powdered Processed Aconite Root, Powdered Rhubarb, Powdered Rose Fruit, Powdered Scutellaria Root, Powdered Senega, Powdered Senna Leaf, Powdered Smilax Rhizome, Powdered Sophora Root, Powdered Sweet Hydrangea Leaf, Powdered Swertia Herb, Powdered Tragacanth, Powdered Zanthoxylum Fruit, Processed Aconite Root, Processed Ginger, Prunella Spike, Pueraria Root, Red Ginseng, Rehmannia Root, Rhubarb, Rice Starch, Rose Fruit, Rosin, Safflower, Saffron, Saposhnikovia Root, Sappan Wood, Sausurea Root, Schisandra Fruit, Schizonepeta Spike, Scopolia Rhizome, Scutellaria Root, Senega, Senna Leaf, Sinomenium Stem, Smilax Rhizome, Sophora Root, Sweet Hydrangea Leaf, Swertia Herb, Termeric, Toad Venom, Tragacanth, Tribulus Fruit, Trichosanthes Root, Uncaria Hook, Zanthoxylum Fruit, Zedoary.

2. Crude drugs are usually used in the forms of whole crude drugs, cut crude drugs or powdered crude drugs.

Whole crude drugs are the medicinal parts or their ingredients prepared by drying and/or simple processes, as specified in the monographs.

Cut crude drugs are small pieces or small blocks prepared by cutting or crushing of the whole crude drugs, and also coarse, medium or fine cutting of the crude drugs in whole, and, unless otherwise specified, are required to conform to the specifications of the whole

crude drugs used as original materials.

Powdered crude drugs are coarse, medium, fine or very fine powder prepared from the whole crude drugs or the cut crude drugs; usually powdered crude drugs as fine powder are specified in the monographs.

3. Unless otherwise specified, crude drugs are used in dried form. The drying is usually carried out at a temperature not exceeding 60°C.

4. The origin of crude drugs is to serve as the criteria. Such statements as 'other species of the same genus' and 'allied plants' or 'allied animals' appearing in the origin of crude drugs usually indicate plants or animals which may be used as materials for crude drugs containing the same effective constituents.

5. Description in each monograph for crude drugs usually covers the crude drug derived from its typical original plant or animal and includes statements of characteristic properties of the crude drug. As for the color, odor and solubility, apply correspondingly to the prescription of the General Notices, except the odor which is to serve as the criteria. The taste and aspects obtained by microscopic observation are to

serve as the criteria.

6. Powdered crude drugs, otherwise specified, may be mixed with diluents so as to attain proper content and potency.

7. Powdered crude drugs do not contain fragments of tissues, cells, cell inclusions or other foreign matter alien to the original crude drugs or cut crude drugs.

8. Crude drugs are as free as possible from contaminants and other impurities due to molds, insects and other animals and from other foreign matters, and are required to be kept in a clean and hygienic state.

9. Crude drugs are preserved under protection from moisture and insect damage, unless otherwise specified. In order to avoid insect damage, suitable fumigants may be used to preserve crude drugs, provided that the fumigants are so readily volatilized as to be harmless at the usual dosage of the crude drugs, and such fumigants that may affect the therapeutic efficacy of the crude drugs or interfere with the testing are precluded.

10. Crude drugs are preserved in well-closed containers unless otherwise specified.

# GENERAL RULES FOR PREPARATIONS

## 1. General Notices for Preparations

(1) General notices for preparations present general rules and definitions for pharmaceutical dosage forms.

(2) Pharmaceutical excipients are substance(s) other than drug substance(s) contained in preparations which are used to increase the utility of the preparation, to enable manufacturing of drug products easy, to keep product's integrity, to improve the appearance of a formulation and so forth. For these purposes, suitable excipients such as diluents, stabilizers, preservatives, buffering agents, corrigents, suspending agents, emulsifiers, aromatics, solubilizers, coloring agents, and viscous agents may be added. The excipients used, however, must be non-toxic, harmless and pharmacologically inactive in the amount administered and must not interfere with the therapeutic efficacy or the quality test of the preparations.

(3) Vegetable oils used for pharmaceutical preparations usually indicate the edible oils listed in the Pharmacopoeia. When starch is called for, any kind of starch incorporated in the Pharmacopoeia may be used, unless otherwise specified.

Moreover, ethanol specified in vol% is prepared by adding purified water or water for injection to ethanol at the specified vol%.

(4) To pharmaceutical preparations, functions which control the releasing rate of drug substance(s), leading to the modified absorption or transfer into the body may be added for the purpose of controlling the onset and duration of therapeutic effects and/or decreasing adverse or side effects. However, modified release preparations must meet the corresponding requirements of dissolution test etc. which specify the releasing rate, unless otherwise specified. In addition, the functional modification of releasing rate must be displayed on the pack insert and direct container or package of the preparation, unless otherwise specified.

(5) Immediate-release and modified-release preparations exist in oral dosage forms which show different release characteristics, respectively. Immediate-release dosage forms are preparations showing a release of drug substance(s), which is not intentionally modified and generally dependent on the intrinsic physicochemi-

cal properties of the drug substance. Modified-release dosage forms are preparations showing a release of drug substance(s) which is suitably modified by a specific formulation design and/or manufacturing method. Modified-release dosage forms include enteric-coated and extended release preparations. Enteric coated preparations are designed to release the majority drug substance(s) in small intestines rather than in stomachs in order to prevent the degradation or decomposition of drug substance(s) in stomach or to decrease the irritant effect of drug substance(s) on stomachs. Enteric coated preparations are generally prepared by applying enteric films to preparations. Extended release preparations are designed to control the releasing rate and time of drug substance(s) and the release sites in gastrointestinal tracts in order to decrease the dosing times and/or to reduce adverse or side effects. Extended release preparations are generally prepared using suitable agents that prolong the drug release. Capsules, tablets, powders, granules, and pills of oral dosage forms can be coated with appropriate coating agents, such as sugar, sugar alcohol, or high-molecular-mass materials to enable the ingestion easy or to prevent degradation of drug substance(s).

(6) When a high level of sterility assurance is maintained consistently, based on the records derived from validation studies of the manufacturing process and the in-process controls, the sterility test usually required for the release of the product may be omitted (Parametric release).

(7) Unless otherwise specified, preserve pharmaceutical preparations at room temperature.

## 2. Aerosols

(1) Aerosols are preparations for use by expelling a solution or suspension of drug substance(s) under a pressure of liquefied or compressed gas filled in a common or different container.

Aerosols are used for topical application, space spray, inhalation, oral administration, etc. Modes of expelling are available in vapor, powder, foam and paste, depending on the purpose of use.

(2) Hermetic containers are used for preservation.



### 3. Aromatic Waters

(1) Aromatic Waters are clear saturated solutions of essential oils or other volatile substances in water.

(2) Unless otherwise specified, Aromatic Waters may be usually prepared by the following process. Shake thoroughly 2 mL of an essential oil or 2 g of a volatile substance with 1000 mL of lukewarm purified water for 15 minutes, set the mixture aside for 12 hours or longer, filter through moistened filter paper, and add purified water to make 1000 mL. Alternatively, incorporate thoroughly 2 mL of an essential oil or 2 g of volatile substances with sufficient refined siliceous earth or pulped filter-paper, add 1000 mL of purified water, agitate thoroughly for 10 minutes, and then filter the mixture. To obtain a clear filtrate, repeat the filtration, and add sufficient water through the filter paper to make 1000 mL.

(3) Aromatic Waters have odor and taste derived from the drug substance(s) and excipients used.

(4) Tight containers are used for preservation.

### 4. Capsules

(1) Capsules are preparations in which liquefied, suspended, semi-solid, powdered or granulated drugs or preparations are enclosed in capsules or wrapped with capsule bases. There are two kinds of capsules, which are:

(i) Hard capsules (ii) Soft capsules

(2) Capsules are usually prepared by the following methods.

(i) Hard capsules: Drug substance(s) or uniform mixtures of drug substance(s) with diluents and other suitable excipients, or granules or preparations prepared by a suitable method, are filled as they are or prepared lightly formed and into hard capsules. Extended-release or enteric-coated capsules can be prepared by filling extended-release or enteric-coated preparations into capsules or by changing the components of capsule shells or coating the capsule with suitable coating agents.

(ii) Soft capsules: Drug substance(s) or mixtures of drug substance(s) with suitable diluents, etc. are enclosed by a suitable capsule such as gelatin plasticized by addition of glycerin, sorbitol, etc., and molded in a suitable shape. If necessary, coloring agents, preservatives, etc. may be added to capsule agents. By changing the components of capsule shells or applying suitable coating agents to capsules, extended-release or enteric-coated capsules can be prepared.

(3) Unless otherwise specified, Capsules meet the

requirements of the Dissolution Test <6.10> or the Disintegration Test <6.09>.

(4) Unless otherwise specified, Capsules meet the requirements of the Uniformity of Dosage Units <6.02>.

(5) Well-closed or tight containers are used for preservation.

### 5. Cataplasms/Gel Patches

(1) Cataplasms/Gel Patches are generally pasty preparations containing the mixture of drug substance(s) and water or those prepared by spreading the mixture on cloth, which are intended for external use.

(2) Unless otherwise specified, Cataplasms/Gel Patches are usually prepared by mixing drug substance(s) with glycerin, water, or other suitable liquid materials, or with high-molecular-mass materials(s) which are soluble in water or absorbent of water until homogeneity is attained.

(3) Pasty cataplasms which have separated out one or more of their components during storage are rehomogenized before use unless the substances have deteriorated.

(4) Tight containers are used for preservation.

### 6. Elixirs

(1) Elixirs are usually clear, sweetened, and aromatic liquid preparations, containing ethanol, intended for oral use.

(2) Elixirs are usually prepared by dissolving drugs or their extractives in ethanol and purified water, adding aromatic agents and sucrose, other sugars or sweetening agents, and clarifying by filtration or other procedures.

(3) Tight containers are used for preservation.

### 7. Extracts

(1) Extracts are prepared by evaporating the extractives of crude drugs. There are two kinds of Extracts which are:

(i) viscous extracts (ii) dry extracts

(2) Unless other-wise specified, Extracts are prepared as follows.

(i) Crude drugs pulverized in suitable sizes, are usually extracted for a certain period of time with suitable solvents by cold extraction or warm extraction, or by percolation as directed in (2) under Tinctures.

The extractive is filtered, and the filtrate is concentrated or dried in a suitable method to produce a millet jelly-like consistency in the case of a viscous extract, and to make crushable solid masses, granules or powder in the case of a dry extract.

Extracts for which the content of the drug substance(s) is specified are prepared by assaying the drug substance(s) in a sample portion and adjusting, if necessary, with suitable diluents to the specified strength.

(ii) Weigh crude drugs pulverized in suitable sizes according to the prescription and heat after adding 10 – 20 times water to them. After liquid-solid separation by centrifuge etc., the filtrate is concentrated or dried in a suitable method to produce a millet jelly-like consistency in the case of a viscous extract, and to make crushable solid masses, granules or powder in the case of a dry extract.

(3) Extracts have odor and taste derived from the crude drugs used.

(4) Unless otherwise specified, Extracts meet the requirements of the Heavy Metals Limit Test <1.07> when the test solution and the control solution are prepared as follows.

Test solution: Ignite 0.3 g of Extracts to ash, warm with 3 mL of the dilute hydrochloric acid, and filter. Wash the residue with two 5 mL portions of water. Neutralize the combined filtrate and washings (indicator: a drop of phenolphthalein TS) by adding ammonia TS until the color of the solution changes to pale red, filter, if necessary, and add 2 mL of the dilute acetic acid and water to make 50 mL.

Control solution: Proceed with 3 mL of dilute hydrochloric acid in the same manner as directed in the preparation of the test solution, and add 3.0 mL of Standard Lead Solution and water to make 50 mL.

(5) Tight containers are used for preservation.

## 8. Fluidextracts

(1) Fluidextracts are liquid percolates of crude drugs, usually prepared so that each mL contains soluble constituents from 1 g of the crude drugs.

(2) Fluidextracts are usually prepared by the percolation process. Mix well 1000 g of coarse powder or fine cutting of the crude drugs with the first solvent to moisten it, close the container, and allow it to stand for about 2 hours at room temperature. Transfer the content to a suitable percolator, stuff it as tightly as possible, open the lower opening of the percolator, and slowly pour the second solvent to cover the crude drugs. Close the lower opening when the solvent begins

to drop, and allow the mixture to stand for 2 to 3 days at room temperature. Open the lower opening, and allow the percolate to run out at the rate of 0.5 to 1.0 mL per minute.

Set aside the first 850 mL of the percolate as the first percolate. Add the second solvent to the percolator, then drip the percolate, and use it as the second percolate.

The time of maceration and the flow rate during percolation may be varied depending on the kind and the amount of the crude drugs used. The flow rate is usually regulated as follows, depending on the amount of the crude drugs used.

Mass of crude drug	Volume of solution running per minute
Not more than 1000 g	0.5 – 1.0 mL
Not more than 3000 g	1.0 – 2.0 mL
Not more than 10,000 g	2.0 – 4.0 mL

Concentrate the second percolate, taking care not to lose the volatile substances of the crude drug, mix with the first percolate, and use it as (A). To (A) add the second solvent to make 1000 mL, and allow the mixture to stand for 2 days. Decant the supernatant liquid or filter the liquid to obtain a clear solution.

Fluidextracts for which the content of the drug substance(s) is specified are obtained by adjusting the content of the drug substance(s) with a sufficient amount of the second solvent, as required on the basis of the result of the assay made with a portion of (A).

Use the specified solvent only in cases where there is no distinction between the first and the second solvent.

(3) Fluidextracts have odor and taste derived from the crude drugs used.

(4) Unless otherwise specified, Fluidextracts meet the requirements of the Heavy Metals Limit Test <1.07> when the test solution and the control solution are prepared as follows.

Test solution: Ignite 1.0 g of Fluidextracts to ash, warm with 3 mL of dilute hydrochloric acid, filter, and wash the residue with two 5 mL portions of water. Neutralize the combined filtrate and washings by adding ammonia TS, filter, if necessary, and add 2 mL of dilute acetic acid and water to make 50 mL.

Control solution: Proceed with 3 mL of dilute hydrochloric acid as directed in the preparation of the test solution, and add 3.0 mL of Standard Lead Solution and water to make 50 mL.

(5) Tight containers are used for preservation.

## 9. Granules

(1) Granules are prepared in a form of granules using drug substance(s) or a mixture of drug substance(s) and excipients.

(2) Granules are made, usually, from drug substance(s) or a uniform mixture of drug substance(s) with diluents, binders, disintegrators or other suitable excipients. The granules are prepared by a suitable method so that the finished granules are preferably equal in size. Extended-release or enteric coated granules can also be prepared by a suitable method.

(3) When the Particle Size Distribution Test <6.03> is performed with granules, all the granules pass through a No. 10 (1700  $\mu\text{m}$ ) sieve, not more than 5% of total granules remain on a No. 12 (1400  $\mu\text{m}$ ) sieve, and not more than 15% of total granules pass through a No. 42 (355  $\mu\text{m}$ ) sieve.

(4) Unless otherwise specified, Granules comply with the Dissolution Test <6.10> or the Disintegration Test <6.09>, provided that this provision does not apply to granules not more than 5% of which remain on a No. 30 (500  $\mu\text{m}$ ) sieve when shaken with a No. 30 sieve as directed under Particle Size Distribution Test <6.03>.

(5) Unless otherwise specified, Granules for single-dose use meet the requirements of the Uniformity of Dosage Units.

(6) Well-closed or tight containers are used for preservation.

## 10. Infusions and Decoctions

(1) Infusions and Decoctions are liquid preparations usually obtained by macerating crude drugs in purified water.

(2) Infusions and Decoctions are usually prepared by the following method. Cut crude drugs as directed below, and transfer 50 g to an infusion or decoction apparatus.

Leaves, flowers, and whole plants: Coarse cutting

Woods, stems, barks, roots, and rhizomes: Medium cutting

Seeds and fruits: Fine cutting

Infusions: Damp an amount of crude drugs with 50 mL of purified water for about 15 minutes, pour 900 mL of hot purified water, and heat for 5 minutes with several shakings. Filter through cloth after cooling.

Decoctions: Heat, with several stirrings, an amount of crude drugs with 950 mL of purified water for 30 minutes, and filter through cloth while warm.

Sufficient purified water is further added to the filtrate through the residue to make 1000 mL of an

infusion or decoction.

Prepare Infusions or Decoctions before use.

(3) Infusions and Decoctions have odor and taste derived from the crude drugs used.

(4) Tight containers are used for preservation.

## 11. Injections

(1) Injections are solutions, suspensions or emulsions of drugs or other preparations that contain drugs to be dissolved or suspended before use. They are sterile preparations to be administered directly into the skin or the body through the skin, or mucous membrane.

(2) Unless otherwise specified, Injections are prepared by dissolving, suspending or emulsifying drug substance(s) in a prescribed volume of the solvent, or by distributing drug substance(s) in hermetic containers for Injections. Every care should be taken to prevent contamination. The entire process of preparing Injections from the preparation of drug solution to the sterilization should be completed as rapidly as possible by taking into consideration the composition of Injection and the storage condition. The concentration of Injections expressed as % indicates w/v%.

Water for injection prepared by Reverse Osmosis-Ultrafiltration shall be sterilized by heating before use. This provision does not apply to Injections and attached solvent, if they are sterilized by heating in the process of manufacture.

Drugs to be dissolved or suspended before use and designated in the title as "for injection" may be accompanied by a suitable solvent.

(3) Solvents used in the preparation of Injections or attached to Injections must be harmless in the amounts usually administered and must not interfere with the therapeutic efficacy or with quality testing.

The solvents are classified into the following two major groups. They should meet the following requirements.

(i) Aqueous vehicles: As the solvent of aqueous injections, water for injection is usually used. Unless otherwise specified, isotonic sodium chloride solution, Ringer's solution, or other suitable aqueous solutions may be used instead. Unless otherwise specified, these aqueous vehicles other than those exclusively for intracutaneous, subcutaneous or intramuscular administration meet the requirements of the Bacterial Endotoxins Test <4.01>.

When the Bacterial Endotoxins Test <4.01> is not applicable to aqueous vehicles, the Pyrogen Test <4.04> may be used.

(ii) Non-aqueous vehicles: Vegetable oils are usually used as solvents for nonaqueous injections. These oils, unless otherwise specified, are clear at 10°C and have no odor or taste suggesting rancidity. The acid value is not more than 0.56, iodine value is between 79 and 137, and the saponification value falls in the range between 185 and 200. They meet the requirements of the Mineral Oil Test <1.05>.

Several suitable organic solvents other than the vegetable oils may be used as nonaqueous vehicles.

(4) The usual size of particles observed in suspensions for injection is not larger than 150  $\mu\text{m}$ , and that of particles in emulsions for injection is not larger than 7  $\mu\text{m}$ . As a rule, suspensions for injection are not to be injected into the vessels or spinal cord, and emulsions for injection, not into the spinal cord.

(5) Unless otherwise specified, any coloring agent must not be added solely for the purpose of coloring the preparations.

(6) Unless otherwise specified, sodium chloride or other suitable excipients may be added to aqueous injections to render them isotonic with blood or other body fluids. Acids or alkalis may be added to them to adjust the pH.

(7) Unless otherwise specified, sufficient amounts of suitable preservatives to prevent the growth of microorganisms are added to Injections filled in multiple dose containers.

(8) Unless otherwise specified, Injections other than those used exclusively for intracutaneous, subcutaneous or intramuscular administration meet the requirements of the Bacterial Endotoxins Test <4.01>.

When the Bacterial Endotoxins Test <4.01> is not applicable to Injections, the Pyrogen Test <4.04> may be used.

(9) Unless otherwise specified, Injections and solvents attached to Injections meet the requirements of the Sterility Test <4.06>.

(10) Usual containers of Injections are colorless and meet the requirements of the Glass Containers for Injections <7.01>. Where specified in individual monographs, these containers may be replaced by colored containers meeting the requirements of the Glass Containers for Injections <7.01> or by plastic containers for aqueous injections meeting the requirements of the Test Methods for Plastic Containers <7.02>.

(11) Unless otherwise specified, rubber stoppers used for glass containers of 100 mL or more of aqueous infusions meet the requirements of the Rubber Closures for Aqueous Infusions <7.03>.

(12) Unless otherwise specified, Injections meet the requirements of the Foreign Insoluble Matter Test for Injections <6.06>.

(13) Unless otherwise specified, Injections meet the requirements of the Insoluble Particulate Matter Test for Injections <6.07>.

(14) Unless otherwise specified, the actual volume of an injection contained in a single-dose container meets the requirements of Test for Extractable Volume of Parenteral Preparations <6.05>.

(15) Unless otherwise specified, Injections to be dissolved or suspended before use meet the requirements of the Uniformity of Dosage Units <6.02>.

(16) Unless otherwise specified, the written, printed, or graphic matter in the package, the container, or the wrapper must include the following information:

(i) Names of employed vehicles and added substance(s), unless the vehicle is water for injection, or sodium chloride solution in concentrations not exceeding 0.9 w/v%, or unless the vehicle contains acids or alkalis in order to adjust the pH of the injections.

(ii) In the case that dissolving vehicles are attached to the preparations, the presence of the vehicles and their names, quantities, compositions or ratios of the vehicles on the outer containers or outer wrappers.

(iii) Names and quantities of added stabilizers, preservatives, and diluents. In the case where nitrogen or carbon dioxide is enclosed in the container to replace the inside air, the statement of this replacement is not necessary.

(17) For ampules or other containers of 2 mL or less, the designations "injection", "for injection" and "aqueous suspension for injection" may be replaced by "inj.", "for inj." and "aq. susp. for inj.", respectively.

For ampules or other containers of more than 2 mL and not exceeding 10 mL, made of glass or similar materials, the designations "injection", "for injection" and "aqueous suspension for injection" may be replaced by "inj.", "for inj." and "aq. susp. for inj.", respectively, when information is printed directly on the surface of ampules or containers.

(18) Hermetic containers are used for preservation. Plastic containers for aqueous injections may be used when specified in an individual monograph.

## 12. Lemonades

(1) Lemonades are sweet, sour, and usually clear liquid preparations intended for oral use.

(2) Unless otherwise specified, Lemonades are usually prepared by dissolving hydrochloric acid, citric acid, L-tartaric acid, or lactic acid in simple syrup and purified water, and filtering if necessary.

Prepare Lemonades before use.

- (3) Tight containers are used for preservation.

### 13. Liniments

(1) Liniments are usually liquid or semisolid preparations intended for external application to the skin by inunction.

(2) Unless otherwise specified, Liniments are usually prepared by adding drugs to water, ethanol, fatty oils, glycerin, soap, emulsifying agents, suspending agents, other suitable excipients or their mixtures, and kneading the mixture until homogeneity is attained.

(3) Liniments which have separated out one or more of their components during storage are rehomogenized before use unless the substances have deteriorated.

- (4) Tight containers are used for preservation.

### 14. Liquids and Solutions

(1) Liquids and Solutions are liquid preparations intended for oral or external use. They are not identical with any other preparations under General Rules for Preparations.

(2) Liquids and Solutions are usually prepared directly with drug substance(s) or by dissolving drug substance(s) in a solvent.

- (3) Tight containers are used for preservation.

### 15. Lotions

(1) Lotions are external preparations applied to the skin by inunction, which are usually prepared by dissolving drug substance(s) in an aqueous vehicle or emulsifying or dispersing them homogeneously.

(2) Unless otherwise specified, Lotions are usually prepared by adding drug substance(s) with solvents, emulsifying agents, suspending agents, etc. to an aqueous vehicle and mixing to complete uniformity by a suitable method.

Prepare before use in the case of Lotions which are apt to deteriorate.

(3) Lotions which have separated out one or more of their components during storage are rehomogenized before use unless the substances have deteriorated.

- (4) Tight containers are used for preservation.

### 16. Ointments

(1) Ointments are usually homogeneous, semisolid preparations for external application, of such consistency that they may be applied to the skin by inunction.

(2) Unless otherwise specified, Ointments are usually prepared by kneading and mixing homogeneously drug substance(s) with fats, fatty oils, lanolin, petrolatum, paraffin, waxes, resins, plastics, glycols, higher alcohols, glycerin, water, emulsifying agents, suspending agents, or other suitable excipients, or with above excipients emulsified in a suitable way as bases.

Prepare before use in the case of Ointments which are apt to deteriorate.

Ointments which are prepared with emulsified bases may be described as Cream.

- (3) Ointments are free from rancid odor.

- (4) Tight containers are used for preservation.

### 17. Ophthalmic Ointments

(1) Ophthalmic Ointments are aseptic ointments intended for the application to the conjunctiva.

(2) Ophthalmic Ointments are usually prepared by the following method. Solution of drug substance(s) or finely powdered drug substance(s) are thoroughly mixed with petrolatum or other suitable materials as a base, and are distributed into collapsible tubes or other tight containers. Sufficient care should be taken to prevent any kinds of contamination, and to proceed as fast as possible in the manufacturing of products.

(3) The particle size of drug substance(s) in Ophthalmic Ointments is usually not larger than 75  $\mu\text{m}$ .

(4) Unless otherwise specified, Ophthalmic Ointments meet the requirements of the Sterility Test <4.06>, and unless otherwise specified, carry out the test by the Membrane filtration method.

(5) Unless otherwise specified, Ophthalmic Ointments meet the requirements of the Test of Metal Particles in Ophthalmic Ointments <6.01>.

The requirement is met if a total of not more than 50 metal particles, each measuring 50  $\mu\text{m}$  or more in any dimension, is found in the 10 samples, and if not more than one sample is found to contain more than 8 such particles. If Ophthalmic Ointments fail the foregoing test, repeat the test on 20 additional samples of Ophthalmic Ointments. The requirement is met if a total of not more than 150 metal particles, each measuring 50  $\mu\text{m}$  or more in any dimension, is found in the 30 samples, and if not more than three samples are

found to contain more than 8 such particles each.

- (6) Tight containers are used for preservation.

## 18. Ophthalmic Solutions

(1) Ophthalmic Solutions are aseptic preparations intended for application to the conjunctiva. They are solutions or suspensions of the drug substance(s), or preparations which contain drug substance(s) to be dissolved or suspended before use.

(2) Unless otherwise specified, Ophthalmic Solutions are prepared either by dissolving or suspending drug substance(s) in a prescribed volume of a solvent, or by placing drug substance(s) in tight containers. Every caution is required to avoid contamination in preparing Ophthalmic Solutions. The entire process of preparing Ophthalmic Solutions should be completed as rapidly as possible. The concentration of Ophthalmic Solutions expressed as % of a drug substance indicates w/v%.

Preparations to be dissolved or suspended before use and designated as "for ophthalmic solutions" may be accompanied by a suitable solvent.

(3) Solvents used in the preparation of Ophthalmic Solutions or attached to Ophthalmic Solutions must be harmless in the amounts usually administered and must not interfere with therapeutic efficacy, or with testing.

Solvents for Ophthalmic Solutions are classified into the following two major groups. They should meet the following requirements.

(i) Aqueous vehicles: The usual vehicle for aqueous ophthalmic solutions is purified water or suitable aqueous solutions. Solvents constituted to Ophthalmic Solutions are sterilized, purified water or suitable sterilized aqueous solutions.

(ii) Non-aqueous vehicles: The vehicles for non-aqueous ophthalmic solutions are usually vegetable oils. Also, suitable organic solvents may be used as non-aqueous solvents for some preparations.

(4) The usual particle size observed in suspensions for Ophthalmic Solutions is not larger than 75  $\mu\text{m}$ .

(5) Unless otherwise specified, no coloring agent may be added solely for the purpose of coloring the preparations.

(6) Unless otherwise specified, sodium chloride or other suitable excipients may be added to aqueous preparations to render them isotonic with lachrymal liquid. Acids or alkalis or other suitable excipients, may be added to aqueous preparations to adjust the pH.

(7) Unless otherwise specified, Ophthalmic Solutions and solvents attached to Ophthalmic Solutions

meet the requirements of the Sterility Test <4.06>.

(8) Ophthalmic Solutions prepared as aqueous solution and aqueous vehicles attached to Ophthalmic Solutions to be prepared before use should be clear and free from foreign insoluble matter when inspected with the unaided eye at a position of luminous intensity of 3000 to 5000 luxes under an incandescent electric bulb. The containers of Ophthalmic Solutions should have a transparency which does not interfere with the test for foreign matter.

(9) Unless otherwise specified, Ophthalmic Solutions meet the Insoluble Particulate Matter Test for Ophthalmic Solutions <6.08>. The limit of the particulates is not more than 1 particle per mL equal to or greater than 300  $\mu\text{m}$ .

- (10) Tight containers are used for preservation.

## 19. Pills

(1) Pills are spherical masses.

(2) Pills are usually prepared by mixing drug substance(s) uniformly with diluents, binders, disintegrators or other suitable excipients, and rolling into spherical form by a suitable method.

(3) Unless otherwise specified, Pills comply with the Dissolution Test <6.10> or the Disintegration Test <6.09>.

(4) Well-closed or tight containers are used for preservation.

## 20. Plasters and Pressure Sensitive Adhesive Tapes

(1) Plasters and Pressure Sensitive Adhesive Tapes are usually used as topical drugs of external use by spreading or sealing a mixture of drug substance(s), bases and excipients on a cloth or on/in a plastic film, and adhering to the skin in order to deliver the drug substance(s) to the disease sites located to the skin or nearby skin.

(2) Unless otherwise specified, Plasters and Pressure Sensitive Adhesive Tapes are usually prepared by mixing bases such as water soluble or insoluble, natural or artificial high-molecular-mass compound, or their mixture uniformly with drug substance(s) and kneading or sealing on a cloth or film into a suitable shape.

Unless otherwise specified, Plasters and Pressure Sensitive Adhesive Tapes prepared from fats, fatty oils, salts of fatty acids, waxes, resins, plastics, purified lanolin, rubber, or a mixture of the above substances, or prepared by mixing the drug substance(s) with the

above bases uniformly and as a solid at the ordinary temperature, may be described as plasters.

(3) Well-closed containers are used for preservation.

## 21. Powders

(1) Powders are preparations in powdered or finely granulated form.

(2) Powders are usually prepared by uniformly mixing drug substance(s) with or without diluents, binders, disintegrators or other suitable excipients by a suitable method to produce a pulverized or finely granulated form.

(3) When the Particle Size Distribution Test <6.03> is performed with Powders, all the powders pass through a No. 18 (850  $\mu\text{m}$ ) sieve and not more than 5% of total powders remain on a No. 30 (500  $\mu\text{m}$ ) sieve. Powders with not more than 10% of total passing through a No. 200 (75  $\mu\text{m}$ ) sieve may be described as Fine Granules.

(4) Unless otherwise specified, Powders for single-dose use meet the requirements of the Uniformity of Dosage Units <6.02>.

(5) Well-closed or tight containers are used for preservation.

## 22. Spirits

(1) Spirits are usually alcoholic or hydro-alcoholic solutions of volatile drug substance(s).

(2) Unless otherwise specified, Spirits are usually prepared by dissolving drug substance(s) in ethanol or in a mixture of ethanol and water.

(3) Tight containers are used for preservation, removing from fire.

## 23. Suppositories

(1) Suppositories are solid preparations intended for insertion into the rectal or vaginal cavity. Suppositories are usually prepared by molding bases into a suitable shape.

Suppositories melt or soften at body temperature or dissolve slowly in the secretions.

(2) Unless otherwise specified, Suppositories are usually prepared by mixing drug substance(s) with fat-type bases, watermiscible bases or other suitable materials, and, if necessary, with emulsifying agents, suspending agents, etc. into a homogeneous mass, and

molding it into a suitable shape or coating it with a suitable coating agent, or prepared as a liquid form-fill-seal.

(3) Rectal suppositories are usually conical or spindle-shaped, and Vaginal suppositories are globular or oval.

(4) Unless otherwise specified, Suppositories meet the requirements of the Uniformity of Dosage Units <6.02>.

(5) Well-closed or tight containers are used for preservation.

## 24. Suspensions and Emulsions

(1) Suspensions and Emulsions are usually liquid preparations of finely divided drug substance(s) suspended or emulsified uniformly in liquid vehicles, respectively.

(2) Suspensions and Emulsions are usually prepared by the following method.

**Suspensions:** Suspensions are prepared by adding suspending agents or other suitable excipients and purified water or oil to drug substance(s), and suspending to complete uniformity by a suitable method.

**Emulsions:** Emulsions are prepared by adding emulsifying agents and purified water to drug substance(s), and emulsifying to complete uniformity by a suitable method.

If necessary, preservatives, stabilizers, etc., may be added.

Prepare before use in the case of Suspensions or Emulsions which are apt to deteriorate.

(3) Mix uniformly before use, if necessary.

(4) Tight containers are used for preservation.

## 25. Syrups

(1) Syrups are oral liquid preparations. Syrups are solutions of sucrose, or viscous liquids or suspensions of drug substance(s) containing sucrose, other sugars or sweetening agents.

Syrups include the preparations which are dissolved or suspended before use depending on the properties of the drug substance(s).

(2) Unless otherwise specified, Syrups are usually prepared by dissolving, mixing, suspending or emulsifying drug substance(s) in solutions of sucrose, other sugars or sweetening agents, or in simple syrup. If necessary, the mixtures are boiled and filtered while hot.

(3) Unless otherwise specified, Syrups which are

dissolved or suspended before use and are for single-dose use (divided dosage forms) meet the requirements of the Uniformity of Dosage Units <6.02>.

(4) Tight containers are used for preservation.

## 26. Tablets

(1) Tablets are prepared by compressing drug substance(s) directly, or by forming or molding drug substance(s) dampened with a solvent into a desired shape and size. Sugar- and film-coated tablets can be prepared by coating core tablets using suitable coating agents containing sugars, sugar alcohols and related substances and by coating with thin films using suitable film coating agents, respectively. Enteric coated and extended release tablets can be prepared by suitable methods.

(2) Tablets are usually prepared by the following procedures:

(i) Drug substance(s) are first rendered granular in a suitable method with or without uniform admixture with a diluent, binder, disintegrator, and other suitable excipients. The resultant granules are provided with additives such as a lubricant, and compressed into a desired shape and size.

(ii) Tablets may also be prepared either by direct compression of drug substance(s) with or without a diluent, binder, disintegrator, and other suitable excipients, or by compression after drug substance(s) with or without suitable excipients have been added to previously prepared inactive granules.

(iii) Tablets may also be prepared by drying the admixture by a suitable method after forming or molding drug substance(s), uniformly mixed with a diluent, binder and other suitable excipients and dampened with a solvent, into a desired shape and size.

(iv) Multilayer tablets can be prepared by compressing different layers of particles or granules in composition. Press-coated tablets can be prepared by covering inner core tablets with different layers in composition by a suitable method.

(3) Unless otherwise specified, Tablets meet the requirements of the Dissolution Test <6.10> or the Disintegration Test <6.09>.

(4) Unless otherwise specified, Tablets meet the requirements of the Uniformity of Dosage Units <6.02>. The requirements for coated tablets are provided in each monograph.

(5) Well-closed or tight containers are used for preservation.

## 27. Tinctures

(1) Tinctures are liquid preparations, and usually prepared by extracting crude drug substance(s) with ethanol or with a mixture of ethanol and purified water.

(2) Unless otherwise specified, Tinctures are usually prepared from coarse powder or fine cuttings of crude drug substance(s) either by maceration or by percolation as described below.

**Maceration:** Place crude drugs in a suitable container, and add about three-fourths of the total volume of a solvent to be used. Stopper, and allow the container to stand at ordinary temperature with occasional stirring for about 5 days or until the soluble constituents have satisfactorily dissolved. Filter the liquid through cloth. Wash the residue with several portions of the solvent, and press. Combine the filtrate and washings, and add sufficient solvent to make up the volume. Allow the mixture to stand for about 2 days, and obtain a clear liquid by decantation or filtration.

**Percolation:** Pour the solvent in small portions on crude drugs placed in a container, and mix well to moisten the crude drugs. Stopper the container, and allow it to stand for about 2 hours at room temperature. Pack the contents as tightly as possible in a suitable percolator, open the lower opening, and slowly pour sufficient solvent to cover the crude drugs. When the percolate begins to drip, close the opening, and allow the mixture to stand for 2 to 3 days at room temperature. Open the opening, and allow the percolate to drip at a rate of 1 to 3 mL per minute. Add an appropriate quantity of the solvent, and continue to percolate until the desired volume has passed. Mix thoroughly, allow standing for 2 days, and obtain a clear liquid by decantation or filtration. The time of standing and the flow rate may be varied depending on the kind and amount of crude drugs to be percolated.

Tinctures prepared by either of the above methods for which the content of the drug substance is specified are prepared by assaying the drug substance using a portion of the sample and adjusting, if necessary, with the percolate or with the solvent to the specified content.

(3) Tight containers are used for preservation, remoting from fire.

## 28. Transdermal Systems

(1) Transdermal Systems are preparations applied to the skin that are designed to deliver drug substance(s) through the skin to the systemic blood circulation.



Transdermal Systems include semisolid mixtures of drug substance(s) and excipients which are used by spreading a suitable amount of the mixture on the backing layer.

(2) Unless otherwise specified, Transdermal Systems are usually prepared by spreading the mixtures of emulsified or suspended drug substance(s) and soluble or insoluble high molecular weight of natural or synthetic bases or their mixtures on the liner or backing sheet. If necessary, adhesives agents, solvents or skin permeation enhancers etc., may be added. The transdermal systems are also prepared by filling the mixture of drug substance(s) and bases or excipients in a reservoir made of a backing layer and a membrane which controls the release of drug substance(s).

(3) Transdermal Systems meet the requirements of release tests specified.

(4) Well-closed or tight containers are used for preservation.

## 29. Troches

(1) Troches are usually preparations of suitable shape to dissolve or disintegrate slowly in the mouth, and are intended for application to the mouth or the throat.

(2) Troches are usually prepared by the following procedures:

(i) Drug substance(s) are first rendered granular by a suitable method with or without uniform admixing with a diluent, binder, and other suitable excipients. The resultant granules are provided with additives such as a lubricant, and compressed into a desired shape and size.

(ii) Troches may also be prepared either by direct compression of drug substance(s) with or without a diluent, binder or other suitable excipients, or by compression of drug substance(s) with or without suitable excipients after they have been uniformly mixed with previously prepared inactive granules.

(iii) Troches are also prepared by mixing drug substance(s) with a diluent such as sucrose, binder, moistening agent, other suitable excipients, etc., to make a homogeneous paste, spreading the paste, stamping out or cutting into a suitable shape and drying.

(3) Unless otherwise specified, Troches meet the requirements of the Uniformity of Dosage Units <6.02>.

(4) Well-closed or tight containers are used for preservation.