jection, equivalent to 0.05 g of Chlorpheniramine Maleate According to the labeled amount, to a beaker, adjust with 0.1 mol/L hydrochloric acid TS or dilute sodium hydroxide TS to a pH between 4.8 and 5.2, if necessary, and evaporate on a water bath to dryness cautiously. Add 20 mL of ethanol (99.5) to the residue, stir thoroughly, and filter. Evaporate the filtrate on a water bath to dryness, and dissolve the residue with 10 mL of water. Transfer the solution to a separator, and extract with two 20-mL portions of chloroform. Combine the chloroform extracts, add 0.01 g of activated charcoal, shake for several minutes, and filter. Evaporate the filtrate with the aid of a current of air by warming in a water bath at about 40°C. Add 0.2 to 0.3 mL of 2-propanol to the residue, shake vigorously, add 10 mL of diethyl ether, rub the inside wall of the beaker with a glass rod, if necessary, and allow to stand. Discard the supernatant liquid, and dry the residue in a desiccator (in vacuum, silica gel) for 1 hour: the residue melts between 128°C and 135°C.

(3) Take a volume of Chlorpheniramine Maleate Injection, equivalent to 0.025 g of Chlorpheniramine Maleate according to the labeled amount, add 5 mL of dilute sodium hydroxide TS, and extract with 20 mL of hexane. Wash the hexane layer with 10 mL of water, shake with 0.5 g of anhydrous sodium sulfate for several minutes, and filter. Evaporate the filtrate in a water bath at about 50°C under a reduced pressure, and determine the infrared absorption spectrum of the residue as directed in the liquid film method under the Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2940 cm^{-1}, 2810 cm^{-1}, 2770 cm^{-1}, 1589 cm^{-1}, 1491 cm^{-1}, 1470 cm^{-1}, 1434 cm^{-1}, 1091 cm^{-1} and 1015 cm^{-1}.

Assay Transfer an exactly measured volume of Chlorpheniramine Maleate Injection, equivalent to about 3 mg of chlorpheniramine maleate ($C_{16}H_{19}ClN_2.C_4H_4O_4$), to a 100-mL separator, add 20 mL of water and 2 mL of sodium hydroxide TS, and extract with two 50-mL portions of diethyl ether. Combine diethyl ether extracts, wash with 20 mL of water, and then extract with 20-mL, 20-mL and 5-mL portions of 0.25 mol/L sulfuric acid TS successively. Combine all acid extracts, and add 0.25 mol/L sulfuric acid TS to make exactly 50 mL. Pipet 10 mL of this solution, and add 0.25 mol/L sulfuric acid TS to make exactly 25 mL. Determine the absorbance A of this solution at a wavelength of the maximum absorbance at about 265 nm as directed under the Ultraviolet-visible Spectrophotometry.

$$\text{Amount (mg) of chlorpheniramine maleate } (C_{16}H_{19}ClN_2.C_4H_4O_4) = \frac{A}{210} \times 1250$$

Containers and storage Containers—Hermetic containers. Storage—Light-resistant.

Chlorpheniramine Maleate Powder

マレイン酸クロルフェニラミン散

Chlorpheniramine Maleate Powder contains not less than 93% and not more than 107% of the labeled amount of *dl*-chlorpheniramine maleate ($C_{16}H_{19}ClN_2.C_4H_4O_4$: 390.86).

Method of preparation Prepare as directed under Powders, with Chlorpheniramine Maleate.

Identification **(1)** Weigh a portion of Chlorpheniramine Maleate Powder, equivalent to 0.05 g of Chlorpheniramine Maleate according to the labeled amount, shake with 40 mL of 0.1 mol/L hydrochloric acid TS, and filter. Transfer the filtrate to a separator, and wash with 40 mL of chloroform. Add 10 mL of sodium hydroxide TS, and extract with 20 mL of hexane. Wash the hexane layer with 5 mL of water. Centrifuge, if necessary, shake the hexane extract with 0.5 g of anhydrous sodium sulfate for several minutes, and filter. To 5 mL of the filtrate [the remaining filtrate to be used in (3)] add 2 mL of Dragendorff's TS, and shake: a red-orange precipitate is produced.

(2) Transfer a portion of Chlorpheniramine Maleate Powder, equivalent to 0.05 g of Chlorpheniramine Maleate according to the labeled amount, to a glass-stoppered flask, add 20 mL of diethyl ether, allow to stand for 10 minutes with frequent shaking, decant, and discard the diethyl ether. Add 20 mL of diethyl ether to the residue, allow to stand for 10 minutes with frequent shaking, decant, and discard the diethyl ether. Repeat the same procedure once more. Dissolve the residue in 20 mL of water, shake for 15 minutes, and centrifuge. Transfer the supernatant liquid to a separator, and extract with two 40-mL portions of chloroform. Combine the chloroform extracts, add 0.01 g of activated charcoal, shake for several minutes, and filter. Evaporate the filtrate with the aid of a current of air by warming in a water bath at about 40°C. Add 0.2 to 0.3 mL of 2-propanol to the residue, shake vigorously, add 10 mL of diethyl ether, rub the inside wall of the beaker with a glass rod, if necessary, and allow to stand. Discard the supernatant liquid, and dry the residue in a desiccator (in vacuum, silica gel) for 1 hour: the residue melts between 128°C and 135°C.

(3) Evaporate the remaining filtrate obtained in (1), in a water bath at about 50°C under a reduced pressure, and determine the infrared absorption spectrum of the residue as directed in the liquid film method under the Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2940 cm^{-1}, 2810 cm^{-1}, 2770 cm^{-1}, 1589 cm^{-1}, 1491 cm^{-1}, 1470 cm^{-1}, 1434 cm^{-1}, 1091 cm^{-1} and 1015 cm^{-1}.

Assay Weigh accurately a portion of Chlorpheniramine Maleate Powder, equivalent to about 3 mg of chlorpheniramine maleate ($C_{16}H_{19}ClN_2.C_4H_4O_4$), transfer to a 100-mL separator, add 20 mL of 0.05 mol/L sulfuric acid TS, and shake for 5 minutes. Add 20 mL of diethyl ether, and allow to stand for 5 minutes with frequent shaking. Centrifuge, if necessary, and filter the water layer through a dry filter paper into a second separator. Extract the diethyl ether layer with two 10-mL portions of 0.05 mol/L sulfuric acid TS, filter the acid extracts, and combine the washings with the filtrate. Wash the filter paper with a small amount of 0.05 mol/L, and combine the washings with the filtrate. Add sodium hydroxide TS, and extract with two 50-mL portions of diethyl ether, combine the diethyl ether extracts, wash with 20 mL of eater, and extract with 20-mL, 20-mL and 5-mL portions of 0.25 mol/L sulfuric acid TS successively. Combine all acid extracts, and add 0.25 mol/L sulfuric acid TS to make exactly 50 mL. Pipet 10 mL of this solution, trans-

fer to a 25-mL volumetric flask, and add 0.25 mol/L sulfuric acid TS to make exactly 25 mL. Determine the absorbance A of this solution at the wavelength of maximum absorbance at about 265 nm as directed under the Ultraviolet-visible Spectrophotometry.

$$\text{Amount (mg) of chlorpheniramine maleate } (C_{16}H_{19}ClN_2.C_4H_4O_4) = \frac{A}{210} \times 1250$$

Containers and storage Containers—Tight containers.

Chlorpheniramine Maleate Tablets

マレイン酸クロルフェニラミン錠

Chlorpheniramine Maleate Tablets contain not less than 93% and not more than 107% of the labeled amount of *dl*-chlorpheniramine maleate ($C_{16}H_{19}ClN_2.C_4H_4O_4$: 390.86).

Method of preparation Prepare as directed under Tablets, with Chlorpheniramine Maleate.

Identification (1) Weigh a portion of powdered Chlorpheniramine Maleate Tablets, equivalent to 0.05 g of Chlorpheniramine Maleate according to the labeled amount, shake with 40 mL of 0.1 mol/L hydrochloric acid TS, and filter. Transfer the filtrate to a separator, and wash with 40 mL of chloroform. Add 10 mL of sodium hydroxide TS, and extract with 20 mL of hexane. Wash the hexane layer with 5 mL of water. Centrifuge, if necessary, shake the hexane extract with 0.5 g of anhydrous sodium sulfate for several minutes, and filter. To 5 mL of the filtrate [the remaining filtrate to be used in (3)] add 2 mL of Dragendorff's TS, and shake: a red-orange precipitate is produced.

(2) Transfer a portion of powdered Chlorpheniramine Maleate Tablets, equivalent to 0.05 g of Chlorpheniramine Maleate according to the labeled amount, to a glass-stoppered flask, add 20 mL of diethyl ether, allow to stand for 10 minutes with frequent shaking, decant, and discard the diethyl ether. Add 20 mL of diethyl ether to the residue, allow to stand for 10 minutes with frequent shaking, decant, and discard the diethyl ether. Repeat the same procedure once more. Dissolve the residue in 20 mL of water, shake vigorously for 15 minutes, and centrifuge. Transfer the supernatant liquid to a separator, and extract with two 40-mL portions of chloroform. Combine the chloroform extracts, add 0.01 g of activated charcoal, shake for a few minutes, and filter. Evaporate the filtrate with the aid of a current of air by warming in a water bath at about 40°C. Add 0.2 to 0.3 mL of 2-propanol to the residue, shake vigorously, add 10 mL of diethyl ether, rub the inside wall of the beaker with a glass rod, if necessary, and allow to stand. Discard the supernatant liquid, and dry the residue in a desiccator (in vacuum, silica gel) for 1 hour: the residue melts between 128°C and 135°C.

(3) Evaporate the remaining filtrate obtained in (1), in a water bath at about 50°C under a reduced pressure, and determine the infrared absorption spectrum of the residue as directed in the film method under the Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2943 cm^{-1}, 2814 cm^{-1}, 2765 cm^{-1}, 1589 cm^{-1}, 1491 cm^{-1}, 1470 cm^{-1}, 1434 cm^{-1}, 1091 cm^{-1} and 1015 cm^{-1}.

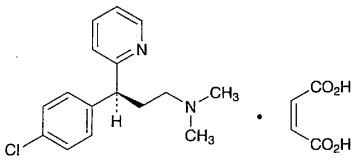
Assay Weigh accurately and powder not less than 20 Chlorpheniramine Maleate Tablets. Weigh accurately a portion of the powder, equivalent to about 3 mg of chlorpheniramine maleate ($C_{16}H_{19}ClN_2.C_4H_4O_4$), to a 100-mL separator, add 20 mL of 0.05 mol/L sulfuric acid TS, and shake for 5 minutes. Add 20 mL of diethyl ether, and allow to stand for 5 minutes with frequent shaking. Centrifuge, if necessary, and filter the water layer through a dry filter paper into the second separator. Extract the diethyl ether layer with two 10-mL portions of 0.05 mol/L sulfuric acid TS, filter the acid extracts, and combine the filtrates with the water layer in the second separator. Wash the filter with a small amount of 0.05 mol/L sulfuric acid TS, and combine the washings with the filtrate. Add sodium hydroxide TS into this solution dropwise until a red litmus paper turns slightly blue, add 2 mL of sodium hydroxide TS, and extract with two 50-mL portions of diethyl ether. Combine the diethyl ether extracts, wash with 20 mL of water, and extract with 20-mL, 20-mL and 5-mL portions of 0.25 mol/L sulfuric acid TS successively. Combine all acid extracts, and add 0.25 mol/L sulfuric acid TS to make exactly 50 mL. Pipet 10 mL of this solution, transfer to a 25-mL volumetric flask, and add 0.25 mol/L sulfuric acid TS to make exactly 25 mL. Determine the absorbance *A* of this solution at the wavelength of maximum absorbance at about 265 nm as directed under the Ultraviolet-visible Spectrophotometry.

$$\text{Amount (mg) of chlorpheniramine maleate } (C_{16}H_{19}ClN_2.C_4H_4O_4) = \frac{A}{210} \times 1250$$

Containers and storage Containers—Tight containers.

d-Chlorpheniramine Maleate

d-マレイン酸クロルフェニラミン



$C_{16}H_{19}ClN_2.C_4H_4O_4$: 390.86
N-[(3*S*)-3-(4-Chlorophenyl)-3-pyridin-2-ylpropyl]-*N*,*N*-dimethylamine monomaleate [*2438-32-6*]

d-Chlorpheniramine Maleate, when dried, contains not less than 99.0% of $C_{16}H_{19}ClN_2.C_4H_4O_4$.

Description *d*-Chlorpheniramine Maleate occurs as a white, crystalline powder. It has no odor, and has a bitter taste.

It is very soluble in water and in acetic acid (100), freely soluble in *N*,*N*-dimethylformamide, in ethanol (95) and in chloroform, and very slightly soluble in diethyl ether.

Identification (1) Dissolve 1 mg of *d*-Chlorpheniramine Maleate in 5 mL of water, add 2 mL of Dragendorff's TS,