

Titrate with 0.5 mol/L sodium hydroxide VS until a light red color remains for not less than 15 seconds. Perform a blank determination in the same manner.

$$\begin{aligned} & \text{Average molecular mass} \\ & = \frac{\text{mass (g) of sample} \times 4000}{a - b} \end{aligned}$$

*a*: Volume (mL) of 0.5 mol/L sodium hydroxide VS consumed in the blank determination.

*b*: Volume (mL) of 0.5 mol/L sodium hydroxide VS consumed in the test of the sample.

Average molecular mass is between 7300 and 9300.

**Water** Not more than 1.0% (2 g, direct titration).

**Residue on ignition** Not more than 0.25% (1 g).

**Containers and storage** Containers—Well-closed containers.

## Macrogl 20000

### Polyethylene Glycol 20000

マクロゴール 20000

Macrogl 20000 is a polymer of ethylene oxide and water, represented by the formula  $\text{HOCH}_2(\text{CH}_2\text{OCH}_2)_n\text{CH}_2\text{OH}$ , in which the value of *n* lies between 340 and 570.

**Description** Macrogl 20000 occurs as white, paraffin-like flakes or powder. It is odorless or has a faint, characteristic odor.

It is freely soluble in water and in pyridine, and practically insoluble in methanol, in ethanol (95), in anhydrous diethyl ether, in petroleum benzene and in macrogl 400.

Congealing point: 56 – 64°C

**Identification** Dissolve 0.05 g of Macrogl 20000 in 5 mL of dilute hydrochloric acid, add 1 mL of barium chloride TS, shake, and filter, if necessary. To the filtrate add 1 mL of a solution of phosphomolybdic acid *n*-hydrate (1 in 10): a yellow-green precipitate is formed.

**pH** Dissolve 1.0 g of Macrogl 20000 in 20 mL of water: the pH of this solution is between 4.5 and 7.5.

**Purity (1)** Clarity and color of solution—Dissolve 5.0 g of Macrogl 20000 in 50 mL of water: the solution is clear and colorless.

(2) Acid—Dissolve 5.0 g of Macrogl 20000 in 20 mL of neutralized ethanol by warming, cool, and add 0.20 mL of 0.1 mol/L sodium hydroxide VS and 1 drop of phenolphthalein TS: the color of the solution is red.

**Average molecular mass** Weigh accurately about 15.0 g of Macrogl 20000, transfer to an about 200-mL glass-stoppered pressure bottle, add about 25 mL of pyridine, dissolve by warming, and allow to cool. Separately, pipet 300 mL of freshly distilled pyridine into a 1000-mL light-resistant glass-stoppered bottle, add 42 g of phthalic anhydride, dissolve with vigorous shaking, and allow to stand for 16 hours or more. Pipet 25 mL of this solution, transfer to the former

pressure bottle, stopper the bottle tightly, wrap it securely with strong cloth, and immerse in a water bath, having a temperature of  $98 \pm 2^\circ\text{C}$ , to the same depth as the mixture in the bottle. Maintain the temperature of the bath at  $98 \pm 2^\circ\text{C}$  for 60 minutes. Remove the bottle from the bath, and allow to cool in air to room temperature. Add exactly 50 mL of 0.5 mol/L sodium hydroxide VS and 5 drops of a solution of phenolphthalein in pyridine (1 in 100). Titrate with 0.5 mol/L sodium hydroxide VS until a light red color remains for not less than 15 seconds. Perform a blank determination.

$$\begin{aligned} & \text{Average molecular mass} \\ & = \frac{\text{mass (g) of sample} \times 4000}{a - b} \end{aligned}$$

*a*: Volume (mL) of 0.5 mol/L sodium hydroxide VS used in the blank determination.

*b*: Volume (mL) of 0.5 mol/L sodium hydroxide VS used in the test of the sample.

Average molecular mass is between 15000 and 25000.

**Water** Not more than 1.0% (2 g, direct titration).

**Residue on ignition** Not more than 0.25% (1 g).

**Containers and storage** Containers—Well-closed containers.

## Macrogl Ointment

### Polyethylene Glycol Ointment

マクロゴール軟膏

#### Method of preparation

Macrogl 4000	500 g
Macrogl 400	500 g

To make 1000 g

Melt Macrogl 4000 and Macrogl 400 by warming on a water bath at  $65^\circ\text{C}$ , and mix well until it congeals. Less than 100 g of Macrogl 4000 or Macrogl 400 may be replaced by an equal amount of Macrogl 400 or Macrogl 4000 to prepare 1000 g of a proper soft ointment.

**Description** Macrogl Ointment is white in color. It has a faint, characteristic odor.

**Identification** Dissolve 0.05 g of Macrogl Ointment in 5 mL of dilute hydrochloric acid, add 1 mL of barium chloride TS, shake, filter if necessary, and add 1 mL of a solution of phosphomolybdic acid *n*-hydrate (1 in 10) to the filtrate: a yellow-green precipitate is formed.

**Containers and storage** Containers—Tight containers.