

# Soaps and Other Anionic Surfactants

Soaps and other anionic surfactants dissociate in aqueous solution to form an anion, which is responsible for the surface activity, and a cation which is devoid of surface-active properties. They are widely used for their emulsifying and cleansing properties. The term **detergent** is used to describe a surface-active agent with such properties that concentrates at oil-water interfaces. Anionic surfactants used in pharmaceutical preparations include:

- **Alkali-metal and ammonium soaps** (monovalent alkyl carboxylates) which are the sodium, potassium, and ammonium salts of the higher fatty acids
- **Metallic soaps** (polyvalent alkyl carboxylates), the calcium, zinc, magnesium, and aluminium salts of the higher fatty acids; they produce water-in-oil emulsions and are often formed by chemical reaction during the preparation of the emulsion
- **Amine soaps**, which are salts of amines with fatty acids
- **Alkyl sulfates or sulfated fatty alcohols**, salts of the sulfuric acid esters of the higher fatty alcohols
- **Alkyl ether sulfates or ethoxylated alkyl sulfates**, formed by sulfating ethoxylated alcohols.
- **Sulfated oils**, which are prepared by treating fixed oils with sulfuric acid and neutralising with sodium hydroxide solution.

Many **sulfonated compounds** have been produced that possess surface-active properties and are used as detergents; they include alkyl sulfonates, alkyl aryl sulfonates, and amide sulfonates. Docusate sodium (p.1725), a sulfonated dibasic acid ester, has medicinal and pharmaceutical uses.

**Ampholytic (or amphoteric) surfactants** possess at least one anionic group and at least one cationic group in the molecule and can therefore have anionic, nonionic, or cationic properties depending on the pH. When the strength of the cationic portion of the molecule is equivalent to that of the anionic portion the isoelectric point occurs at pH 7 and the molecule is said to be balanced. Ampholytic surfactants have the detergent properties of anionic surfactants and the disinfectant properties of cationic surfactants. Their activity depends on the pH of the media in which they are used. Compounds used include aminocarboxylic acids, aminopropionic acid derivatives, imidazoline derivatives, and dodicin. Long-chain betaines are sometimes classed as ampholytic surfactants.

Balanced ampholytic surfactants are reputed to be non-irritant to the eyes and skin and have therefore been used in baby shampoos.

## Aluminium Monostearate

Aluminii monostearas; Aluminium, monostearate de; Aluminum Monostearate; Glinu monostearynian; Monoestearato de aluminio; Monostearato de aluminio. Dihydroxy(octadecanoato-O-)aluminium; Dihydroxy(stearato)aluminium.

Алюминий Моностеарат

CAS — 7047-84-9.

**Pharmacopoeias.** In *Jpn* and *Pol*. Also in *USNF*.

**USNF 26** (Aluminum Monostearate). A compound of aluminum with a mixture of solid organic acids obtained from fats and consisting mainly of variable proportions of aluminum monostearate and aluminum monopalmitate. A fine, white to yellowish-white, bulky powder with a faint characteristic odour. Insoluble in water, in alcohol, and in ether.

### Profile

Aluminium monostearate is used as a gelling agent in oil-based cosmetic and pharmaceutical formulations. It may also be used as a stabiliser in cosmetic emulsions.

## Calcium Stearate

Calcii stearas; Calcium, stéarate de; Estearato de calcio; Kalcio stearatas; Kalziumstearat; Kalcium-sztearát; Kalsiumstearatti; Stearan vápenaty. Calcium octadecanoate.

Кальция Стеарат

CAS — 542-42-7 (*calcium palmitate*); 1592-23-0 (*calcium stearate*).

**Pharmacopoeias.** In *Eur* (see p.vii), *Int.*, and *Jpn*. Also in *US-NF*.

**Ph. Eur. 6.2** (Calcium Stearate). A mixture of calcium salts of different fatty acids consisting mainly of stearic acid ( $C_{36}H_{70}CaO_4 = 607.0$ ) and palmitic acid ( $C_{32}H_{62}CaO_4 = 550.9$ ) with minor proportions of other fatty acids. The fatty acid fraction contains not less than 40.0% of stearic acid and the sum of stearic acid and palmitic acids is not less than 90.0%. A fine, white or almost white, crystalline powder. Practically insoluble in water and in alcohol.

**USNF 26** (Calcium Stearate). A compound of calcium with a mixture of solid organic acids obtained from fats, consisting mainly of variable proportions of calcium stearate ( $C_{36}H_{70}CaO_4 = 607.0$ ) and calcium palmitate ( $C_{32}H_{62}CaO_4 = 550.9$ ). A fine, white to yellowish-white bulky, unctuous powder, free from grittiness with a slight characteristic odour. Insoluble in water, in alcohol, and in ether.

### Profile

Calcium stearate is added to granules as a lubricant in the manufacture of tablets and capsules.

**Adverse effects.** Acute eosinophilic pneumonia in 1 patient has been attributed to the presence of calcium stearate used as an additive in an antihistamine tablet formulation.<sup>1</sup>

1. Kurai J, et al. Acute eosinophilic pneumonia caused by calcium stearate, an additive agent for an oral antihistaminic medication. *Intern Med* 2006; **45**: 1011-16.

## Calcium Stearyl-lactylate

Calcium Stearyl-2-lactylate; E482. Calcium 2-(I-Carboxyethoxy)-I-methyl-2-oxoethyloctadecanoate.

Стеаролактилат Кальция

CAS — 5793-94-2.

## Sodium Stearyl-lactylate

E481; Sodium Stearyl-2-lactylate. Sodium 2-(I-Carboxyethoxy)-I-methyl-2-oxoethyloctadecanoate sodium salt.

Стеаролактилат Натрия

CAS — 25383-99-7.

### Profile

Sodium stearyl-lactylate has anionic surfactant properties and is used as an emulsifier and stabilising and suspending agent in the food industry, including in foods for special diets. The calcium salt is used similarly.

## Magnesium Stearate

572; Estearato de magnesio; Magnesii stearas; Magnésium, stéarate de; Magnesiumstearatti; Magnesiumstearat; Magnézium-szterátt; Magnezu stearynian; Magnio stearatas; Stearan hořčnatý. Стеарат Магния

CAS — 1555-53-9 (*magnesium oleate*); 2601-98-1 (*magnesium palmitate*); 557-04-0 (*magnesium stearate*).

**Pharmacopoeias.** In *Chin.*, *Eur* (see p.vii), *Int.*, *Jpn*, and *Viet.* Also in *USNF*.

**Ph. Eur. 6.2** (Magnesium Stearate). A mixture of the magnesium salts of different fatty acids consisting mainly of stearic acid ( $C_{36}H_{70}MgO_4 = 591.2$ ) and palmitic acid ( $C_{32}H_{62}MgO_4 = 535.1$ ) and in minor proportions other fatty acids. The fatty acid fraction contains not less than 40.0% of stearic acid and the sum of stearic acid and palmitic acid is not less than 90.0%. A white or almost white, very fine, light powder, greasy to the touch. Practically insoluble in water and in dehydrated alcohol.

**USNF 26** (Magnesium Stearate). A compound of magnesium with a mixture of solid organic acids, and consisting mainly of variable proportions of magnesium stearate ( $C_{36}H_{70}MgO_4 = 591.2$ ) and magnesium palmitate ( $C_{32}H_{62}MgO_4 = 535.1$ ). It is a very fine, light, white powder, slippery to touch. Insoluble in water, in alcohol, and in ether.

### Profile

Magnesium stearate is added to granules as a lubricant in the manufacture of tablets and capsules. It has also been used as a dusting powder and in barrier creams.

### Preparations

**Proprietary Preparations** (details are given in Part 3)

**Multi-ingredient:** *Fr.*: Oilitum AD<sup>†</sup>; *Mex.*: Bonaven; *Philippe*: Physiogel.

## Sodium Cetostearyl Sulfate

Cetostearylulfato de sodio; Cétostéaryle (sulfate de) sodique; Cetylstearylschwefelsäures Natrium; Natrui cetyl- et stearyl-sulfas; Natrui cetosteario sulfatas; Natrium Cetyl sulphuricum; Natrium Cetylstearylosulphuricum; Nátrium-cetyl-sztearil-szulfát; Natriumcetostearylulfat; Natrium-cetylstearyl-sulfát; Natrium-setostearylisulfatty; Sodium Cetostearyl Sulphate; Sodu ceto-stearylsoiarcanz.

Натрия Цетостеарильтульфат

CAS — 1120-01-0 (*sodium cetyl sulfate*); 1120-04-3 (*sodium stearyl sulfate*).

**Pharmacopoeias.** In *Eur* (see p.vii). Also in *USNF*.

**Ph. Eur. 6.2** (Sodium Cetostearyl Sulphate). A mixture of sodium cetyl sulfate ( $C_{16}H_{33}NaSO_4 = 344.5$ ) and sodium stearyl sulfate ( $C_{18}H_{37}NaSO_4 = 372.5$ ). A white or pale yellow, amorphous or crystalline powder. Soluble in hot water giving an opalescent solution; practically insoluble in cold water; partly soluble in alcohol.

**USNF 26** (Sodium Cetostearyl Sulfate). A mixture of sodium cetyl sulfate ( $C_{16}H_{33}NaSO_4 = 344.5$ ) and sodium stearyl sulfate ( $C_{18}H_{37}NaSO_4 = 372.5$ ). It contains not less than 40% of sodium cetyl sulfate and the sum of the sodium cetyl sulfate content and sodium stearyl sulfate content is not less than 90%, both contents calculated on the anhydrous basis. A white or pale yellow, amorphous or crystalline powder. Soluble in hot water giving an opalescent solution; practically insoluble in cold water; partly soluble in alcohol.

### Profile

Sodium cetostearyl sulfate is an anionic emulsifying agent. It is used as a detergent and wetting agent.

## Sodium Cocoyl Isetionate

Sodium Cocoyl Isetionate.

Кокома Изетионат Натрия

CAS — 61789-32-0.

### Profile

Sodium cocoyl isetionate is the sodium salt of a sulfonated ester of coconut oil fatty acids. It is an anionic surfactant used as a soap substitute. Sodium cocoyl sarcosinate has been used similarly.

### Preparations

**Proprietary Preparations** (details are given in Part 3)

**Fr.**: Physiogel; **Hong Kong**: Physiogel; **Indon.**: Physiogel; **Ital.**: Physiogel; **Malaysia**: Physiogel; **Singapore**: Physiogel; **Thai.**: Physiogel.

**Multi-ingredient:** *Fr.*: Oilitum AD<sup>†</sup>; *Mex.*: Bonaven; *Philippe*: Physiogel.

## Sodium Laurilsulfate (p/NMM)

Laurilsulfato de Sodium; Laurilsulfato de sodio; Natrii laurilsulfas; Natrio laurilsulfatas; Natrium Lauryl Sulphuricum; Natriumlaurilsulfat; Nátrium-lauril-szulfát; Natrium-lauryl-sulfát; Natriumlaurylsulfatty; Sodium Dodecyl Sulphate; Sodium laurilsulfate de; Sodium Lauryl Sulfate; Sodium Lauryl Sulphate; Sodu dodecylosiarczan patrz: Sodu laurylosiarczan; Sodu laurylosiarczan.

Натрий Лаурилсультфат

CAS — 151-21-3.

**Pharmacopoeias.** In *Chin.*, *Eur* (see p.vii), and *Jpn*. Also in *USNF*.

**Ph. Eur. 6.2** (Sodium Laurilsulfate; Sodium Lauryl Sulphate BP 2008). A mixture of sodium alkyl sulfates, consisting mainly of sodium dodecyl sulfate ( $C_{12}H_{25}NaSO_4 = 288.4$ ). It contains not less than 85% of sodium alkyl sulfates and not more than a total of 8% of sodium chloride and sodium sulfate. A white or pale yellow powder or crystals. Freely soluble in water giving an opalescent solution; partly soluble in alcohol.

**USNF 26** (Sodium Lauryl Sulfate). A mixture of sodium alkyl sulfates, consisting mainly of sodium laurilsulfate ( $C_{12}H_{25}NaSO_4 = 288.4$ ). The combined content of sodium chloride and sodium sulfate is not more than 8%. Small, white or light yellow crystals with a slight, characteristic odour. Soluble 1 in 10 of water giving an opalescent solution.

**Incompatibility.** Sodium laurilsulfate interacts with cationic surfactants such as cetrimide, resulting in a loss of activity. It is also incompatible with salts of polyvalent metal ions (e.g. aluminium, lead, tin, or zinc) and with acids of pH below 2.5. It is not affected by hard water because of the solubility of the corresponding calcium and magnesium salts.

### Profile

Sodium laurilsulfate is an anionic emulsifying agent. It is a detergent and wetting agent, effective in both acid and alkaline solution and in hard water. It is used in medicated shampoos and as a skin cleanser and in toothpastes. It is used in the preparation of Emulsifying Wax (p.2029). Prolonged exposure to sodium laurilsulfate may irritate the skin or mucous membranes.

Other salts of laurilsulfate have been used for their surfactant properties. These include monoethanolamine, diolamine, and trolamine laurilsulfates, and magnesium and ammonium laurilsulfates. Similar surfactants include sodium lauril ether sulfate and sodium alkyl sulfoacetates such as sodium lauril sulfoacetate.

Sodium laurilsulfate and related surfactants are also included in some combination preparations used rectally for the management of constipation.

## Preparations

**BP 2008:** Emulsifying Wax.

### Proprietary Preparations

(details are given in Part 3)

**Arg.:** Euroclear; Limectant; **Chile:** Solucion Detergente; **Fr.:** Gyalmet; **Ital.:** Salforelle; **Hong Kong:** Lowila Cake; **Mex.:** Aquanil; **Spain:** Anticerumen.

**Multi-ingredient:** **Arg.:** Caien; Micronema; Nigalax; Plus & Plus; **Austral.:** Fleet Micro-Enema; Microlax; Pinetarsol; **Austria:** Mikroklist; **Belg.:** Micro-lax; Neo-Sabery; **Canad.:** Microlax; Plax; **Cz.:** Demofug; **Denm.:** Micro-lax; **Fin.:** Microlax; **Fr.:** Bactident; Microlax; Ysol 206; **Ger.:** Dermowas; Mikroklist; **Gr.:** Sabeny; **Hong Kong:** Fleet Micro-Enema; Microlax; **Indon.:** Lakarex; **Irl.:** Micolette; **Ital.:** Eso Zim; Novafax; **Malaysia:** Dentinox Cradle Cap; Lorasil Feminine Hygiene; **Microlax:**; **Mex.:** Microlax; **Neth.:** Casen Mikrolaxma; **Norw.:** Microlax; **NZ:** Fleet Micro-Enema; **Pol.:** Rektiokto; **Port.:** Fleet Micro-Enema; **Rus.:** Microlax (Микролакс); **S.Afr.:** Medigel; **Micro-lax:**; **Singapore:** Dentinox Cradle Cap; **Microlax:**; **Spain:** Clisteran; **Micro-lax:**; **Swed.:** Fleet Microf; **Micro-lax:**; **Switz.:** Mikroko; **UK:** Dentinox Cradle Cap; Micolette; **Micralax:**; Relaxit; **USA:** Bod Kleen; Cetaklenz; Geni-Lav Free; Klout; Maxilube; Summers Eve Post-Menstrual; Trichotine; Trimox-San; **Venez.:** Novafix; Vitar†.

## Sodium Oleate

Oleato de sodio.

Оleinovокислый Натрий

CAS — 143-19-1.

## Profile

Sodium oleate is an anionic surfactant used as an ingredient in preparations for the symptomatic relief of haemorrhoids and pruritus ani.

Zinc oleate and potassium oleate have also been used in skin preparations, while the sodium, potassium, and calcium salts have had applications as food additives.

## Preparations

### Proprietary Preparations

(details are given in Part 3)

**Multi-ingredient:** **Belg.:** Cose-Anal; **Ger.:** Alcos-Anal†; Neo-Ballistol†; **Neth.:** Epianal; **Norw.:** Alcos-Anal; **Swed.:** Alcos-Anal.

## Sodium Stearate

Esteарат де содио; Natrii stearas; Natrio stearatas; Natrium-stearatt; Natriumstearat; Sodium, стéарат de; Sodu stearynan; Stearin sodný.

Стеарат Натрия

CAS — 408-35-5 (sodium palmitate); 822-16-2 (sodium stearate).

**Pharmacopoeias.** In Eur. (see p.vii). Also in USNF.  
**Ph. Eur. 6.2** (Sodium Stearate). A mixture of sodium salts of different fatty acids consisting mainly of stearic acid ( $C_{18}H_{35}O_2Na = 306.5$ ) and palmitic acid ( $C_{16}H_{33}O_2Na = 278.4$ ). It contains 7.4 to 8.5% of sodium, calculated with reference to the dried substance. The fatty acid fraction contains not less than 40% of stearic acid and the sum of stearic acid and palmitic acid is not less than 90%. A white or yellowish, fine powder, with a greasy touch. Slightly soluble in water and in alcohol. Store in airtight containers. Protect from light.

**USNF 26** (Sodium Stearate). A mixture containing not less than 90% of sodium stearate ( $C_{18}H_{35}NaO_2 = 306.5$ ) and sodium palmitate ( $C_{16}H_{33}NaO_2 = 278.4$ ); the content of sodium stearate is not less than 40% of the total. It contains small amounts of the sodium salts of other fatty acids. A fine, white powder, soapy to the touch, usually with a slight tallow-like odour. Slowly soluble in cold water and in cold alcohol; readily soluble in hot water and in hot alcohol. Protect from light.

## Profile

Sodium stearate is an emulsifying and stiffening agent used in a variety of topical and rectal preparations.

## Sodium Stearyl Fumarate

Fumarato de estearo y sodio; Natrii stearylis fumaras; Natrio stearifumaratas; Natriumstearylfumarat; Natrium-stearyl-fumarat; Natriumstearylfumaraatti; Nátrium-sztéaril-fumarárt; Stéaryle (fumarate de) sodique.

Натрия Стэарилфумарат

$C_{22}H_{39}NaO_4 = 390.5$ .

CAS — 4070-80-8.

**Pharmacopoeias.** In Eur. (see p.vii). Also in USNF.

**Ph. Eur. 6.2** (Sodium Stearyl Fumarate). A fine, white or almost white powder with agglomerates of flat, circular shaped particles. Practically insoluble in water, in alcohol, and in acetone; slightly soluble in methyl alcohol.

**USNF 26** (Sodium Stearyl Fumarate). A fine white powder. Practically insoluble in water; slightly soluble in methyl alcohol.

## Profile

Sodium stearyl fumarate is used as a lubricant in the manufacture of tablets and capsules.

## Sodium Tetradecyl Sulfate (rINN)

Natrii Tetradecyl Sulfas; Natriumtetradecylsulfat; Natriumtetradekylsulfát; Sodium Tetradecyl Sulphate; Tetradecilsulfato de sodio; Тетрадецил Сульфат де Содиум. Sodium 4-ethyl-1-isobutyloctyl sulfate.

Натрия Тетрадецил Сульфат

$C_{14}H_{29}NaO_4S = 316.4$ .

CAS — 139-88-8.

ATC — C05BB04.

ATC Vet — QC05BB04.

**Pharmacopoeias.** Br. includes as a concentrated form.

**BP 2008** (Sodium Tetradecyl Sulphate Concentrate). A clear, colourless gel. Store at a temperature not exceeding 25°. Protect from light.

## Adverse Effects and Precautions

The complications of injection sclerotherapy with sclerosants such as sodium tetradecyl sulfate are discussed under Monoethanolamine Oleate, p.2346.

## Uses and Administration

Sodium tetradecyl sulfate is an anionic surfactant. It has sclerosing properties and is used in the treatment of varicose veins (p.2347). It has also been given in the management of bleeding oesophageal varices (p.2346), and tried in endoscopic injection therapy for nonvariceal bleeding associated with peptic ulcer disease (p.1702).

For sclerotherapy of varicose veins a solution of sodium tetradecyl sulfate is injected slowly into the lumen of an isolated segment of an emptied superficial vein, followed by compression. Solutions are available in a variety of strengths (0.2 to 3%); doses depend on the site and condition being treated. A test dose is advisable in patients with a history of allergy. Facilities for treating anaphylaxis should be available.

## Preparations

**BP 2008:** Sodium Tetradecyl Sulphate Injection.

### Proprietary Preparations

(details are given in Part 3)

**Arg.:** Fibro-Vein; **Austral.:** Fibro-Vein†; **Canad.:** Tromboject; Trombovar†; **Cz.:** Fibro-Vein†; **Fr.:** Trombovar; **Hung.:** Fibro-Vein; **Ital.:** Fibro-Vein; Trombovar; **Malaysia:** Trombovar†; **Neth.:** Trombovar; **NZ:** Fibro-Vein; **Rus.:** Trombovar (Тромбовар); **S.Afr.:** Fibrovein; STD; **UK:** Fibro-Vein; **USA:** Sotradecol.

## Soft Soap

Green Soap; Jabón blando; Jabón de potasa; Jabón verde; Medicinal Soft Soap; Mydlo potasowe; Potassium Soap; Sabão Mole; Sapo Molis.

Зелёное Мыло; Калиевое Мыло

**Pharmacopoeias.** In Br., Chin., and US.

**BP 2008** (Soft Soap). It is made by the interaction of potassium hydroxide or sodium hydroxide with a suitable vegetable oil or oils or their fatty acids. It may be coloured with chlorophyll or not more than 0.015% of a suitable green soap dye. A yellowish-white to green or brown, unctuous substance. Soluble in water and in alcohol.

**USP 31** (Green Soap). It is made by the saponification of suitable vegetable oils, excluding coconut oil and palm kernel oil, without the removal of glycerol. The method given in the USP 31 involves mixing the oil with oleic acid and to the heated mixture adding potassium hydroxide dissolved in glycerol and water. The homogeneous emulsion is then adjusted to weight with hot water. A yellowish-white to brownish- or greenish-yellow, transparent to translucent, soft unctuous mass with a slight, characteristic odour.

## Adverse Effects and Treatment

Soaps and anionic detergents, in general, may be irritant to the skin by removing natural oils and may produce redness, soreness, cracking and scaling, and papular dermatitis. There may be some irritation of the mucous membranes and this limits the use of soap enemas; marked irritation may occur if soaps or detergents enter the eye. Ingestion of anionic detergents may cause gastrointestinal irritation with nausea, diarrhoea, intestinal distension, and occasionally vomiting. Treatment is symptomatic.

## Uses

Soft soap is used to remove incrustations in chronic scaly skin diseases such as psoriasis (p.1583) and to cleanse the scalp before the application of lotions. A solution of soft soap in warm water has been used as an enema to soften impacted faeces but should be avoided as it may inflame the colonic mucosa; other measures are now preferred (see Constipation, p.1693). Alcohol-free solutions of soft soap, such as Soap Spirit (BP 2008) and Green Soap Tincture (USP 31), are used as skin cleansers and detergents.

Potash soap (linseed oil soap) has been used in the preparation of liquid soaps. Hard soap (castile soap) and curd soap were formerly used as pill excipients and hard soap was also formerly used in the preparation of plasters.

## Preparations

**BP 2008:** Soap Spirit;

**USP 31:** Green Soap; Green Soap Tincture.

### Proprietary Preparations

(details are given in Part 3)

**Multi-ingredient:** **Austria:** Waldheim Abfuhrdragees forte; Waldheim Abfuhrdragees mild; **Spain:** Linimento Naion; **USA:** Therevac Plus; Therevac SB.

## Sulfated Castor Oil

Ацете de ricino sulfatado; Ol. Ricin. Sulphat; Oleum Ricini Sulphatum; Red Oil; Sulfonated Castor Oil; Sulphated Castor Oil; Turkey-red Oil.

Ализариновое Масло; Сульфированное Кастроровое Масло  
CAS — 8002-33-3.

## Profile

Sulfated castor oil is a detergent and wetting agent derived from castor oil (p.2278); it has been used as a skin cleanser and emulsifying agent. Sodium ricinoleate has been used similarly.

Sulfated hydrogenated castor oil (hydroxystearin sulfate) has been used in the manufacture of hydrophilic ointment bases and other emulsions.

## Zinc Stearate

Cinko stearatas; Cink-sztéarát; Cynku stearynian; Estearato de zinc; Sinkkistearaatti; Stearan zinečnatý; Zinc, стéарат de; Zinci stearas; Zinkstearat.

Стеарат Цинка

CAS — 4991-47-3 (zinc palmitate); 557-05-1 (zinc stearate).

**Pharmacopoeias.** In Eur. (see p.vii) and US.

**Ph. Eur. 6.2** (Zinc Stearate). Zinc stearate [ $(C_{17}H_{35}CO_2)_2Zn = 632.3$ ] may contain varying proportions of zinc palmitate [ $(C_{15}H_{31}CO_2)_2Zn = 576.2$ ] and zinc oleate [ $(C_{17}H_{33}CO_2)_2Zn = 628.3$ ]. A light, white or almost white, amorphous powder, free from gritty particles. Practically insoluble in water and in dehydrated alcohol.

**USP 31** (Zinc Stearate). A compound of zinc with a mixture of solid organic acids obtained from fats and consisting mainly of variable proportions of zinc stearate [ $(C_{17}H_{35}CO_2)_2Zn = 632.3$ ] and zinc palmitate [ $(C_{15}H_{31}CO_2)_2Zn = 576.2$ ]. A fine, white, bulky powder, free from grittiness, with a faint characteristic odour. Insoluble in water, in alcohol, and in ether.

## Adverse Effects

Zinc stearate inhalation has caused fatal pneumonitis, particularly in infants.

## Uses

Zinc stearate is added to granules as a lubricant in the manufacture of tablets and capsules.

Zinc stearate has also been used as a soothing and protective application in the treatment of skin inflammation. It may be used either alone or with other powders or in the form of a cream.

## Preparations

**USP 31:** Compound Clioquinol Topical Powder.

### Proprietary Preparations

(details are given in Part 3)

**Multi-ingredient:** **Arg.:** Prurisedan; **Ital.:** Steril Zeta; **Switz.:** Hydrocortisone compositum; **Thail.:** Banocin; **UK:** Simpsons.