

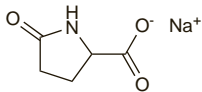
**Sodium Pidolate** (*pINN*)

NaPCA; Natrii Pidoles; Pidolate de Sodium; Pidolato sódico; Piroglutamato sódico; Pirrolidona carboxilato de sodio; Sodium Pyroglutamate; Sodium Pyrrolidone Carboxylate. Sodium 5-oxopyrrolidine-2-carboxylate.

Натрий Пидолат

$C_5H_7NNaO_3 = 152.1$ .

CAS — 28874-51-3 (*D,L*-sodium pidolate); 54571-67-4 (*L*-sodium pidolate).

**Profile**

Sodium pidolate is used as a humectant. It is applied topically as a cream or lotion, often in multi-ingredient preparations, in the treatment of dry skin disorders.

Copper and zinc pidolate are used similarly; they have also been used as nutritional supplements.

**Preparations**

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

**Arg.:** Effaclar; **Hong Kong:** DermaVeen.

**Multi-ingredient:** **Arg.:** Effapha; Lacticare; Sabal; **Austral.:** Dermadrate; DermaVeen Moisturising; DermaVeen Shower & Bath; **Braz.:** Effaclar; Lacticare; **Chile:** Lacticare; **Fr.:** BiaZinc; Cu-Zn; DS Emulsion; Effaclar; Hydracuire; Hyseke; Lacticare; Mycogel; **Hong Kong:** Dermadrate; DS Emulsion; Lacticare; Mycogel; **India:** Efaderm; **Indon.:** Lacticare; **Irl.:** Effaclar; Effaclar K; Hydromol; Lacticare; **Ital.:** Angstrom Viso; **Malaysia:** Lacticare; **Mex.:** Lacticare; **NZ:** Dermadrate; **Philipp.:** Lacticare; **S.Afr.:** Lacticare; **Singapore:** Dermadrate; DermaVeen Shower & Bath; Effaclar K; Lacticare; Stop-Itch Plus; **Thai.:** Lacticare; **UK:** Hydromol; Lacticare.

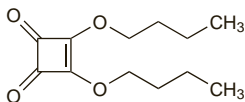
**Squaric Acid Dibutylester**

Éster dibutílico del ácido escuárico; Quadratic Acid Dibutylester; SADBE. The dibutyl ester of 3,4-dihydroxy-3-cyclobutene-1,2-dione; 3,4-Dibutoxy-3-cyclobutene-1,2-dione; .

Дибутиловый Эфир Сквариковой Кислоты

$C_{12}H_{18}O_4 = 226.3$ .

CAS — 2892-62-8 (*squaric acid dibutylester*); 2892-51-5 (*squaric acid*).

**Profile**

Squaric acid dibutylester has been tried similarly to diphenylprone (p.1594) as a contact sensitizer in the treatment of alopecia. It has also been tried in warts.

**References.**

1. Tosti A, *et al.* Long-term results of topical immunotherapy in children with alopecia totalis or alopecia universalis. *J Am Acad Dermatol* 1996; **35**: 199–201.
2. Micali G, *et al.* Treatment of alopecia areata with squaric acid dibutylester. *Int J Dermatol* 1996; **35**: 52–6.
3. Lee AN, Mallory SB. Contact immunotherapy with squaric acid dibutylester for the treatment of recalcitrant warts. *J Am Acad Dermatol* 1999; **41**: 595–9.
4. Silverberg NB, *et al.* Squaric acid immunotherapy for warts in children. *J Am Acad Dermatol* 2000; **42**: 803–8.
5. Micali G, *et al.* Use of squaric acid dibutylester (SADBE) for cutaneous warts in children. *Pediatr Dermatol* 2000; **17**: 315–18.
6. Dall'Oglio F, *et al.* Adult and paediatric contact immunotherapy with squaric acid dibutylester (SADBE) for recurrent, multiple, resistant, mucocutaneous anogenital warts. *Sex Transm Infect* 2002; **78**: 309–10.
7. Dall'Oglio F, *et al.* Topical immunomodulator therapy with squaric acid dibutylester (SADBE) is effective treatment for severe alopecia areata (AA): results of an open-label, paired-comparison, clinical trial. *J Dermatol Treat* 2005; **16**: 10–14.
8. Ajith C, *et al.* Efficacy and safety of the topical sensitizer squaric acid dibutyl ester in alopecia areata and factors influencing the outcome. *J Drugs Dermatol* 2006; **5**: 262–6.

**Sulfur**

Azúfre; Enxófre; Kén; Kükürt; Rikkj; Schwefel; Siarka; Síra; Soufre; Sulphur; Sulphurium; Svavel.

Cepa

$S = 32.065$ .

CAS — 7704-34-9.

ATC — D10AB02.

PhAC Vet — QD10AB02.

**Pharmacopoeias.** In *Chin., Eur.* (see p.vii), *Jpn.* and *US*. Some have monographs for Precipitated Sulfur (Milk of Sulfur), Sublimed Sulfur (Flowers of Sulfur), or both. Some specify it is only for external use.

**Ph. Eur. 6.2** (Sulphur for External Use). A yellow powder. The size of most of the particles is not greater than 20 micrometres and that of almost all the particles is not greater than 40 micrometres. Practically insoluble in water; soluble in carbon disulfide; slightly soluble in vegetable oils. Protect from light.

**USP 31** (Precipitated Sulfur). A very fine, pale yellow, odourless, amorphous or microcrystalline powder. Practically insoluble in water; very slightly soluble in alcohol; slowly and usually incompletely soluble 1 in 2 of carbon disulfide; soluble 1 in 100 of olive oil.

**USP 31** (Sublimed Sulfur). A fine, yellow, crystalline powder with a faint odour. Practically insoluble in water and in alcohol; sparingly soluble in olive oil.

**Adverse Effects and Precautions**

Topical application of sulfur can cause skin irritation and dermatitis has been reported after repeated application. Contact with the eyes, mouth, and other mucous membranes should be avoided. Contact with sulfur can discolour certain metals such as silver, and application of sulfur with topical mercurial compounds can lead to the generation of hydrogen sulfide which has a foul odour and may stain the skin black.

**Handling.** Sulfur has been used for the illicit preparation of explosives or fireworks; care is required with its supply.

**Uses and Administration**

Sulfur is a keratolytic, a mild antiseptic, a mild antifungal, and a parasiticide.

Colloidal sulfur has a smaller particle size than either precipitated or sublimed sulfur. It is sulfur in an aqueous medium containing a colloid such as albumin or gelatin.

Sulfur has been widely used in lotions, creams, or ointments, usually combined with other agents, in concentrations of up to 10% in the treatment of acne, dandruff, seborrhoeic conditions, scabies, and superficial fungal infections, although there are more convenient and effective preparations.

Lotions of precipitated sulfur with lead acetate have been used to darken grey hair.

Sulfur was also formerly used as a mild irritant laxative.

Sulfur is used in homeopathic medicine.

**General references.**

1. Lin AN, *et al.* Sulfur revisited. *J Am Acad Dermatol* 1988; **18**: 553–8.
2. Gupta AK, Nicol K. The use of sulfur in dermatology. *J Drugs Dermatol* 2004; **3**: 427–31.

**Preparations**

**BPC 1973:** Salicylic Acid and Sulphur Ointment;

**USP 31:** Resorcinol and Sulfur Topical Suspension; Sulfur Ointment.

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

**Arg.:** Macbirs; Macbirs Sulphur; Merbenloc; Suldiamint; **Braz.:** Sabonete Sulfuroso; **Canad.:** Postacne; **Cz.:** Aknepur; **Ger.:** Sulfopino; **Indon.:** Acne Feldin; **JF Sulfur;** **Ital.:** Acqua di Sirmione; **Misun;** Sapoli; **Malaysia:** JF Sulfur; **Philipp.:** Erasul; **Sulderm;** **Turk.:** Capila Savon; **USA:** Acne Lotion 10; Liqumatt; Sulfoam; Sulmasque.

**Multi-ingredient:** **Arg.:** Acnomel; Azufurad; Bentophyto; Bifena; C-G; Farnigras; Medicate; Molnia; Nemeget; Onelacne; Pinkdot; Sastid; Suffisance; Tersoderm Cabellos Grastos; **Austral.:** Acne & Pimple Gel; Clearasil Acne Treatment Cream; Egopsoryl TA; Eskamel; Neo-Medrol; Psor-Assit; **Austria:** Aknidhot; Alpicort; Eucarbon; Herposic; Leukona-Sulfomoor-Bad; Sabatiff; Salyk; Schwefelbad Dr Klopfer; Sulfo-Schwefelbad; Visamt; **Braz.:** Acnase; Actine; Akiorl; Circanetten; Dermac; Dermic Polvino Antisseptico; Salder S; Salisop; Sastid; Talco Alivio; Varicell; **Canad.:** Boil Ease; Clearasil Acne Control; Clearasil Acne Cream; Mazon Medicated Shampoo; Medrol Acne Lotion; Meted; Neo-Medrol Acne; Pernox; Sebulex; Sebuto; Sterex; Sterex Plus; Sulfacet-R; **Chile:** Acnaid; Antiacne; Dermac Crema; Sastid Jabon; **Cz.:** Acne Cream; **Fin.:** Neo-Medrol comp; **Wicne:** Wicnecarb; **Fr.:** Dermo-Sulfury; Paps; Selo; Solacy; Sulfuryl; Zeniac; **Ger.:** Anthydral M; **Elisux;** Fango-Rubrimet; Schwefelbad Dr Klopfer; Sulfredox; Sulfurettent; **Wisam;** N; **Hong Kong:** 2-4-2; Acne-Aid; Acnederm; Anthydral M; Cociois; Egopsoryl TA; Neo-Medrol Acne; Sastid; **Hung.:** Bolus Laxans; Schwefelbad Dr Klopfer; **India:** Persol Forte; **Indon.:** Bioacne; Feldixid; Sastid; **Irl.:** Cociois; Meted; Pragmatar; **Israel:** Acnax; Calatrim cum Sulphur; Duo-Scabli; Eucarbon; Neo-Medrol; Sulfo-Salicyl; **Ital.:** Acnesant; Anti-Acne; Eucarbon; Geroderm Zolfo; Lenirose; Medrol Lozione Antiacne; Sacnel; Same-Seb; Saugella Solido Zolfo; Troca Flu Spray Nasale; **Malaysia:** Acne-Aid; Acnederm; Clearasil Pimple Treatment; Cociois; Egopsoryl TA; Eucarbon; Neo-Medrol; Nixoderm; Sastid; **Mex.:** Crema Axell; Dermac; Jabon del Tio Nacho; Locion Axell; Sastid; **NZ:** Acnederm; Clearasil; Coco-Scalp; Cociois; Egopsoryl TA; **Philipp.:** Dermalin; Sastid; **Pol.:** Acne Sulf; Bals-Sulphur; Cociois; Dermaknel; Zdroj; **Port.:** All Picum; Resodermil; Sucedermil; **Rus.:** Olimetin (Олиметин); **S.Afr.:** Balsam Sulphuris; Clearasil T; Cuticurat; Eskamel; Haarlemensis; Neo-Medrol; Sastid; **Singapore:** Acne Clear; Acne-Aid; Clearasil Pimple Treatment; Egopsoryl TA; Neo-Medrol; Sastid; **Spain:** Acnisidin; Crisilaxo; Laxante Sanatorium; Modern Acne; Sastid; **Swed.:** Sevorex; **Switz.:** Acne Creme; Acne Gel; Ektoselene; Sebo-Soufrol; Soufrol TP; **Thai.:** Circanetten; Neo-Medrol; Sastid; **Turk.:** Eucarbon; Karboseptin; Wilkinson; **UK:** Actina; Balto Foot Balm; Clearasil Active Treatment Cream; Cociois; Eskamel; Herbfale Ointment; Meted; Pragmatar; Psoravol; Sebco; Simpsons; Skin Clear; TCP; **USA:** Acno; Acnomel; Acnotex; Avar; Aveeno Cleansing Bar; Bensulfoid; Boil Ease; Clenia; Finac; Fostex Medicated; Fostril; Meted; MG217 Medicated Tar-Free; MG400; Nicosyn; Novacet; Pernox; Plexion; Rezamid; Rosac; Rosanil; Rosula; Sastid; Seale's Lotion; Sebasorb; Sebex; Sebex-T; Sebulex; Sulfacet-R; Sulfocin; Sulfoxyl; Sulpho-Lac; Suphera; Thera; Zetac; **Venez.:** Acnil; Al-dent; Bori-Zinc; Klerly; Nioslin; Sastid; Selenil.

**Sulfurated Lime**

Cal sulfurada; Calcium Sulphide; Calx Sulphurata; Sulfuro cálcico; Sulphurated Lime.

Сернистый Кальций (calcium sulfide); Сульфид Кальция (calcium sulfide)

CAS — 8028-82-8 (*sulfurated lime solution*).

**Profile**

Sulfurated lime is a mixture containing calcium sulfate and not less than 50% of calcium sulfide (CaS), prepared by heating calcium sulfate with carbonaceous matter. Sulfurated lime solution (Vleminkx's solution) is an aqueous solution containing calcium polysulfides and calcium thiosulfate prepared by boiling sublimed sulfur with calcium hydroxide in water.

Sulfurated lime has been used topically as sulfurated lime solution for acne, scabies, seborrhoeic dermatitis, and pustular infections such as boils and carbuncles. A similar solution known as 'lime-sulphur' is used as a fungicide in horticulture.

An impure grade of calcium sulfide (Hepar Sulphuris; Hepar Sulph.) is used in homeopathic medicine.

NOTE. The title Hepar Sulfuris is also applied to Sulfurated Potash (see below).

**Preparations**

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

**Multi-ingredient:** **Cz.:** Homeovox.

**Sulfurated Potash**

Foie de Soufre; Hepar Sulfuris; Hígado de azufre; Kalii Sulfidum; Liver of Sulphur; Potasa sulfurada; Potassa Sulphurata; Schwefel-leber; Sulphurated Potash.

Серная Печень

CAS — 39365-88-3.

NOTE. The title Hepar Sulphuris is used in homeopathic medicine for an impure grade of calcium sulfide—see Sulfurated Lime, above.

**Pharmacopoeias.** In *US*.

**USP 31** (Sulfurated Potash). A mixture composed chiefly of potassium polysulfides and potassium thiosulfate, containing not less than 12.8% of sulfur as sulfide. Irregular, liver-brown pieces when freshly made, changing to greenish-yellow. It has an odour of hydrogen sulfide. Soluble 1 in 2 of water, usually leaving a slight residue. Alcohol dissolves only the sulfides. A 10% solution is light brown in colour and alkaline to litmus. Store in small, airtight containers.

**Incompatibility.** Sulfurated potash is incompatible with acids.

**Profile**

Sulfurated potash has been used in the treatment of acne and other skin disorders usually in the form of a lotion with zinc sulfate.

**Preparations**

**USP 31:** Zinc Sulfide Topical Suspension.

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

**Multi-ingredient:** **Austria:** Leukona-Sulfomoor-Bad.

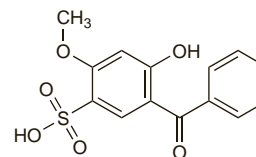
**Sulisobenzene** (*USAN, rINN*)

Benzofenon-4; Benzophenone-4; NSC-60584; Sulisobenzona; Sulisobenzonum. 5-Benzoyl-4-hydroxy-2-methoxybenzenesulphonic acid.

Сулизобензон

$C_{14}H_{12}O_6S = 308.3$ .

CAS — 4065-45-6.



NOTE. Escalol 577 and Uvinul MS 40 are trade names that have been used for sulisobenzene.

**Pharmacopoeias.** In *US*.

**USP 31** (Sulisobenzene). Light tan powder. M.p. about 145°. Freely soluble in water, in alcohol, and in methyl alcohol; sparingly soluble in ethyl acetate. Store in airtight containers. Protect from light.

**Profile**

Sulisobenzene, a substituted benzophenone, is a sunscreen (p.1576) with actions similar to those of oxybenzone (p.1608). It is effective against UVB and some UVA light (for definitions, see p.1580).

