

Poisoning. References.

1. Moeschlin S. Thallium poisoning. *Clin Toxicol* 1980; **17**: 133-46.
2. Heyl T, Barlow RJ. Thallium poisoning: a dermatological perspective. *Br J Dermatol* 1989; **121**: 787-92.
3. Luckit J, et al. Thrombocytopenia associated with thallium poisoning. *Hum Exp Toxicol* 1990; **9**: 47-8.
4. Moore D, et al. Thallium poisoning. *BMJ* 1993; **306**: 1527-9.
5. Tabandeh H, Thompson GM. Visual function in thallium toxicity. *BMJ* 1993; **307**: 324.
6. Questel F, et al. Thallium-contaminated heroin. *Ann Intern Med* 1996; **124**: 616.
7. Tromme I, et al. Skin signs in the diagnosis of thallium poisoning. *Br J Dermatol* 1998; **138**: 321-5.
8. Hoffman RS. Thallium poisoning during pregnancy: a case report and comprehensive literature review. *J Toxicol Clin Toxicol* 2000; **38**: 767-75.
9. Misra UK, et al. Thallium poisoning: emphasis on early diagnosis and response to haemodialysis. *Postgrad Med J* 2003; **79**: 103-5.
10. Hoffman RS. Thallium toxicity and the role of Prussian blue in therapy. *Toxicol Rev* 2003; **22**: 29-40.
11. Thompson DF, Callen ED. Soluble or insoluble Prussian blue for radiocesium and thallium poisoning? *Ann Pharmacother* 2004; **38**: 1509-14.
12. Kuo H-C, et al. Acute painful neuropathy in thallium poisoning. *Neurology* 2005; **65**: 302-4.

Treatment of Adverse Effects

Gastric lavage should be considered if the patient presents within 1 hour of acute ingestion. Intensive supportive therapy is necessary.

Attempts have been made to increase the faecal and urinary excretion of thallium. A suspension of activated charcoal has been given to reduce intestinal absorption and enteric recycling. Prussian blue (p.1461) given orally as a drink or via a nasogastric tube is also used routinely. A purgative such as mannitol may be required with either activated charcoal or Prussian blue as constipation is common in severe thallium toxicity. Giving potassium chloride by mouth may mobilise thallium from the tissues but is hazardous, especially if given during the early stage as signs of poisoning may be aggravated. Traditional chelation therapy is not generally recommended for thallium poisoning.

Haemoperfusion, haemodialysis, or peritoneal dialysis have been reported to be effective in eliminating absorbed thallium, although clinical benefit is doubtful.

Uses and Administration

Thallium acetate was formerly used by mouth for depilation in ringworm and as an ingredient of depilatory creams but both systemic and local treatments have caused deaths, and it is no longer used for such purposes. It has also been used as a rodenticide and insecticide; thallium sulfate has been used similarly. The use of thallium salts is strictly regulated in many countries. However, use in industry could still constitute a hazard. Cases of malicious poisoning still occur occasionally.

Theobroma

Cacao or Cocoa Powder; Chocolate; Teobroma; Theobrom.

Pharmacopoeias. In *USNF*.

USNF 26 (Chocolate). A powder prepared from the roasted, cured kernels of the ripe seed of *Theobroma cacao* (Sterculiaceae).

Profile

Theobroma is used as a flavoured basis for tablets and lozenges. Theobroma oil (p.2033) is used as a basis for suppositories.

Breast feeding. The American Academy of Pediatrics¹ states that irritability or increased bowel activity have been reported in infants whose mothers ate excessive amounts of chocolate (16 ounces (about 450 g) or more daily).

1. American Academy of Pediatrics. The transfer of drugs and other chemicals into human milk. *Pediatrics* 2001; **108**: 776-89. Correction. *ibid.* 1029. Also available at: <http://aappolicy.aappublications.org/cgi/content/full/pediatrics%3b108/3/776> (accessed 08/07/04)

Preparations

USNF 26: Chocolate Syrup.

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: **Austria:** Asthmatee EF-EM-ES.

Theodrenaline Hydrochloride (BANM, rINN) ⓧ

H-8352; Hidrocloruro de teodrenalina; Noradrenaline Theophylline Hydrochloride; Théodrénaline, Chlorhydrate de; Theodrenalini Hydrochloridum. 7-[2-(3,4,β-Trihydroxyphenethylamino)ethyl]theophylline hydrochloride.

Теодреналина Гидрохлорид

$C_{17}H_{21}N_5O_5 \cdot HCl = 411.8$.

CAS — 13460-98-5 (theodrenaline); 2572-61-4 (theodrenaline hydrochloride).

ATC — C01CA23.

ATC Vet — QC01CA23.

Profile

Theodrenaline is mainly used as the hydrochloride in preparations with cafédrine promoted for the treatment of hypotension.

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: **Austria:** Akrinor; **Fr.:** Praxinor; **Ger.:** Akrinor†; **S.Afr.:** Akrinor; **Spain:** Bifort†.

Thioctic Acid

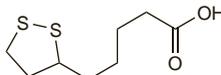
Acide thioctique; Acidum thiocticum; Alpha Lipoic Acid; Kwasioktynowy; Kyselina thioctová; Lipoic Acid; α-Lipoic Acid; Tióctico, ácido, 5-(1,2-Dithiolan-3-yl)valeric acid.

$C_8H_{14}O_2S_2 = 206.3$.

CAS — 62-46-4.

ATC — A16AX01.

ATC Vet — QA16AX01.



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

Ph. Eur. 6.2 (Thioctic Acid). A yellow, crystalline powder. M.p. about 61°. Very slightly soluble in water; very soluble in dimethylformamide; freely soluble in methyl alcohol. Protect from light.

USP 31 (Alpha Lipoic Acid). M.p. 60.0° to 62.0°.

Profile

Thioctic acid is used for its antioxidant effects in the treatment of diabetic neuropathy. It has been tried in the treatment of liver dysfunction and in subacute necrotising encephalopathy. Beneficial results have been claimed in amanitin poisoning after ingestion of the mushroom *Amanita phalloides*, but such use is controversial (see under Poisonous Mushrooms or Toadstools, p.2349). Ethylenediamine thioctate, sodium thioctate, thioctic acid amide (thioctamide), and trometamol thioctate have been used similarly.

Diabetic neuropathy. References¹⁻⁵ to the benefits of thioctic acid in diabetic neuropathy.

1. Ziegler D, et al. Effects of treatment with the antioxidant α-lipoic acid on cardiac autonomic neuropathy in NIDDM patients: a 4-month randomized controlled multicenter trial (DEKAN study). *Diabetes Care* 1997; **20**: 369-73.
2. Ziegler D, et al. Treatment of symptomatic diabetic polyneuropathy with the antioxidant α-lipoic acid: a 7-month multicenter randomized controlled trial (ALADIN III study). *Diabetes Care* 1999; **22**: 1296-1301.
3. Ametov AS, et al. The sensory symptoms of diabetic polyneuropathy are improved with α-lipoic acid: the SYDNEY trial. *Diabetes Care* 2003; **26**: 770-6. Correction. *ibid.*; 2227.
4. Ziegler D, et al. Treatment of symptomatic diabetic polyneuropathy with the antioxidant α-lipoic acid: a meta-analysis. *Diabet Med* 2004; **21**: 114-21.
5. Ziegler D, et al. Oral treatment with α-lipoic acid improves symptomatic diabetic polyneuropathy: the SYDNEY 2 trial. *Diabetes Care* 2006; **29**: 2365-70.

Pharmacokinetics. References.

1. Teichert J, et al. Pharmacokinetics of alpha-lipoic acid in subjects with severe kidney damage and end-stage renal disease. *J Clin Pharmacol* 2005; **45**: 313-28.

Preparations

USP 31: Alpha Lipoic Acid Capsules; Alpha Lipoic Acid Tablets.

Proprietary Preparations (details are given in Part 3)

Arg.: Biletan; Ciagen; Neurotioc; Neutracoil; Sigmus; Tioctan; **Austria:** Thioctacid; Tioctan; **Cz.:** Alpha-Lipon†; Thioctacid; Thiogamma; **Ger.:** Alpha-Lipogamma; Alpha-Lipon; alpha-Vibolex; Alphaflam; Azulipont†; Biomolipon; duralipon; espa-lipon†; Fenint†; Juthiac†; Neurium; Pleomix-Alpha†; Thioctacid; Thiogamma; Tromlipon; Verla-Lipon; Vitatrans; **Hung.:** Thioctacid; Thiogamma; **Indon.:** Alanox; Mecola Forte; **Ital.:** Tiobec Crema; **Jpn.:** Tiocant†; **Mex.:** Thioctacid; **Pol.:** Neurex; Thiogamma; **Rus.:** Berlithon (Берлитион); Эспа-Липон (Эспа-липон); Thioctacid (Тиюктацид); Thiogamma (Тиюгамма); **Thai.:** Lipocin†.

Multi-ingredient: **Arg.:** Biletan Enzimatico; Carbogasol Digestivo; Co-Ti-octan; Nervomax TB12; **Canad.:** Biotrim†; **Hong Kong:** Lipochol; **India:** Alclin-†; **Indon.:** Alicron; Aptivium Liver Support; Mecola; Reliv; **Ital.:** Alfa Lip; Angovien; Byodonorol; Depatoc; Lipoacid Combi; Neuralfa; Neuroptic; Osteolip; Tiobec; Tiofort; **Philipp.:** Illumina; **Port.:** Lipoacid; Lipoacid Combi†; **Spain:** Policolinolisi; **Thai.:** Lipochol.

Thiomucase

C-84-04; Chondroitinsulphatase; Tiomucasa.

Profile

Thiomucase is a mucopolysaccharidase with general properties similar to those of hyaluronidase, p.2321, but which also depolymerises chondroitin sulfate. It has been given to assist the diffusion of local anaesthetic injections.

Preparations

Proprietary Preparations (details are given in Part 3)

Spain: Thiocase.

Multi-ingredient: **Braz.:** Thiomucase.

Thiotriazoline

Tiotriazolín. Morpholine 5-methyl-1,2,4-triazoline-5-thioacetate.

Тиотриазолин

Profile

Thiotriazoline is reported to have anti-ischæmic, membrane stabilising, and antioxidant actions. It is used as a hepatoprotectant in various liver disorders and as a protectant in cardiovascular and cerebrovascular disorders. It is also used locally as an anti-inflammatory for wounds and lesions of the skin and mucous membranes and for vaginal or rectal inflammation.

Thiram (USAN, rINN)

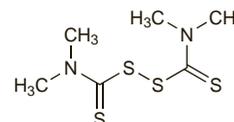
NSC-1771; SQ-1489; Thirame; Thiramum; Tiram; Tiramo; TMT; TMTD. Tetramethylthiuram disulphide.

Тирам

$C_6H_{12}N_2S_4 = 240.4$.

CAS — 137-26-8.

ATC — P03AA05.

**Profile**

Thiram, the methyl analogue of disulfiram (p.2296), has antibacterial and antifungal activity. It has been applied topically as an aerosol in the treatment of wounds and other skin disorders. It has been used as a fungicide in agriculture, and in industry as a rubber accelerator. Occupational exposure to thiram may cause irritation of mucous membranes and skin.

Thorium Dioxide

Thorium Oxide; Torio, dióxido de.

$ThO_2 = 264.0$.

CAS — 1314-20-1.

Profile

Colloidal solutions of thorium dioxide were formerly used as X-ray contrast media for examination of the liver and spleen, for arteriography, and occasionally for outlining the cerebral ventricles. Its elimination is very slow and incomplete. It accumulates in the reticuloendothelial system, especially in the liver and spleen. As it is radioactive (half-life: 1.41×10^{10} years), this accumulation is dangerous and there is strong evidence that the ensuing prolonged exposure to its radiation is a contributing factor in the development of malignant diseases and blood disorders of ten 20 to 30 years after its use.

Thuja

Tuya; White Cedar.

Profile

Thuja consists of the fresh leaves and twigs of *Thuja occidentalis* (Cupressaceae). It is included in some topical preparations for warts and in herbal antiseptic preparations. It is also used in herbal preparations for respiratory-tract disorders.

The oil distilled from the leaves and twigs is known as thuja oil or cedar leaf oil. It has been included in preparations for inhalation for the relief of respiratory-tract symptoms and for external use but is generally considered to be too toxic for internal use. Cedar leaf oil should be distinguished from cedar wood oil, obtained from *Juniperus virginiana* (see Red Cedar, p.2278).

Homoeopathy. Thuja has been used in homoeopathic medicines under the following names: Thuja occidentalis.

Preparations

Proprietary Preparations (details are given in Part 3)

Chile: Thujaederm.

Multi-ingredient: **Austral.:** Vicks Vaporub; **Austria:** Colda; Esberitox; Pe-Ce; **Belg.:** Aponil; Vicks Vaporub; **Braz.:** Calope†; Mentalo†; Vicks Vaporub; **Fr.:** Item Alphacade; Item Alphazole; Item Lentex; Nitro†; Verrupan; Vicks Vaporub; **Ger.:** Esberitox N; **Malaysia:** Esberitox N; **Pol.:** Esberitox N; **Port.:** Alpha Cade; Alphacade; Alphazole†; **S.Afr.:** Vicks Vaporub; **Spain:** Nitroina; **Switz.:** Esberitop; Vicks Vaporub N; **Turk.:** Kataljin; Vicks Vaporub; **USA:** Vicks Vaporub.

Thymalfasin (USAN, rINN)

Thymalfasine; Thymalfasinum; Thymosin α1; Timalfasina.

Тимальфазин

CAS — 62304-98-7; 69521-94-4.

Profile

Thymalfasin is a thymus hormone (p.2401) found in thymosin fraction 5 (a crude thymus gland extract) but now produced by synthesis. Thymalfasin is used alone or with interferon as an im-