brittle and shows a crystalline fracture. When exposed to air it rapidly absorbs moisture and carbon dioxide. Soluble 1 in 1 of water; freely soluble in alcohol. Store in airtight containers.

Adverse Effects

Sodium hydroxide is strongly alkaline and corrosive, and rapidly destroys organic tissues.

The ingestion of caustic alkalis causes immediate burning pain in the mouth, throat, substernal region, and epigastrium, and the lining membranes become swollen and detached. There is dysphagia, hypersalivation, vomiting with the vomitus becoming blood-stained, diarrhoea, and shock. In severe cases, abdominal pain, asphyxia due to oedema of the glottis, circulatory failure, oesophageal or gastric perforation, peritonitis, or pneumonia may occur. Stricture of the oesophagus can develop weeks or months later.

Caustic alkalis on contact with the skin can produce full thickness burns leading to extensive damage. Alkali burns to the eyes cause conjunctival oedema and corneal destruction; damage may be irreversible.

Treatment of Adverse Effects

Ingestion should not be treated by lavage or emesis. Dilution with water or milk is generally considered controversial for management of corrosive ingestion. However, early dilution therapy of alkalis may reduce oesophageal injury; large volumes of fluid should be avoided. Neutralisation of alkalis is contra-indicated. The airway should be maintained and shock and pain alleviated.

In cases of skin contamination, clothing should be removed immediately and the skin flooded with copious amounts of water for at least 15 minutes. Excision or skin grafting of burnt areas may be necessary in severe cases. Contaminated eyes should be irrigated thoroughly with water or 0.9% sodium chloride until the conjunctival sac pH is normal, which may require irrigation for up to an hour.

Uses and Administration

Sodium hydroxide is a powerful caustic. A 2.5% solution in glycerol has been used as a cuticle solvent. An escharotic preparation of sodium hydroxide and calcium oxide was known as London paste. Sodium hydroxide is also used for adjusting the pH of solutions.

Disinfection. For reference to the possible use of sodium hydroxide for the disinfection of material contaminated by the agent causing Creutzfeldt-Jakob disease, see p.1622.

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: ***Austria:*** Leberinfusion; Sulfo-Schwefelbad; ***Ger.:*** Glutarsin E†; ***Switz.:*** Saltrates†.

Sodium Iodoheparinate

Iodoheparinate Sodium; Iodoheparinato de sodio.

ATC — S01XA09.

ATC Vet — QS01XA09.

Profile

Sodium iodoheparinate is a derivative of heparin (p.1301) that has been used topically for the treatment of corneal burns and ulceration.

Sodium Methylarsinate

Metilarsinato de sodio; Natrium Methylarsonicum; Sodium Metharsinite. Disodium monomethylarsonate hexahydrate.

$CH_3AsNa_2O_3,6H_2O$ = 292.0.

CAS — 5967-62-4.

Profile

Sodium methylarsinate is an organic arsenic compound with adverse effects similar to those of arsenic trioxide (p.2260). It was formerly included in some vitamin and mineral preparations. It has also been used as a herbicide.

Sodium Morrhuate *(rINN)*

Morrhuate de Sodium; Morrhuate Sodium; Morruato de sodio; Natrii Morrhuas; Natriummorruatti; Natriummorruat.

Натрия Морруат

CAS — 8031-09-2.

Pharmacopoeias. *Chin.* and *US* include the injection.

Profile

Sodium morrhuate consists of the sodium salts of the fatty acids of cod-liver oil. It is a sclerosant that has been used in the treatment of varicose veins (p.2347). Usual doses are 50 to 100 mg for small or medium veins or 150 to 250 mg for large veins given as a 5% solution by intravenous injection.

Preparations

USP 31: Morrhuate Sodium Injection.

Proprietary Preparations (details are given in Part 3)

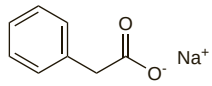
USA: Scleromate.

Sodium Phenylacetate *(USAN)*

Fenilacetato de sodio.

$C_8H_7NaO_2$ = 158.1.

CAS — 114-70-5.



Profile

Sodium phenylacetate is used as adjunctive treatment for acute hyperammonaemia and associated encephalopathy in patients with enzymatic deficiencies in the urea cycle (p.1929). It is given with sodium benzoate (p.1630) as a combined preparation for intravenous infusion in which 1 mL contains 100 mg of each component. The preparation is diluted in sterile glucose injection 10% at ≥25 mL/kg before infusion. Other similar therapies (e.g. oral sodium phenylbutyrate, see below) should be stopped before starting the infusion. A loading dose is infused over 90 to 120 minutes followed by an equivalent maintenance dose infused over 24 hours. Doses of sodium phenylacetate (together with the same amount of sodium benzoate) are 250 mg/kg for patients weighing 20 kg or less, and 5.5 g/m^2 for those over 20 kg. Maintenance infusions are continued until plasma ammonia concentrations are normal or oral nutrition and therapy can be tolerated. Sodium phenylacetate has also been given by mouth.

◊ References.

1. The Urea Cycle Disorders Conference Group. Consensus statement from a conference for the management of patients with urea cycle disorders. *J Pediatr* 2001; **138** (suppl 1): S1–S5.
2. Summar M. Current strategies for the management of neonatal urea cycle disorders. *J Pediatr* 2001; **138** (suppl 1): S30–S39.
3. Batshaw ML, *et al.* Alternative pathway therapy for urea cycle disorders: twenty years later. *J Pediatr* 2001; **138** (suppl 1): S46–S55. Correction. *ibid.* 2002; **140:** 490.
4. MacArthur RB, *et al.* Pharmacokinetics of sodium phenylacetate and sodium benzoate following intravenous administration as both a bolus and continuous infusion to healthy adult volunteers. *Mol Genet Metab* 2004; **81** (suppl 1): S67–S73.
5. Enns GM, *et al.* Survival after treatment with phenylacetate and benzoate for urea-cycle disorders. *N Engl J Med* 2007; **356:** 2282–92.

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: ***USA:*** Ammonul; Ucephan.

Sodium Phenylbutyrate *(BAN, USAN)*

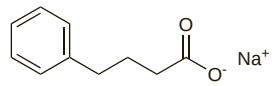
Fenilbutirato de sodio; Natrii phenylbutyras; Natriumfenylbutyrat; Natriumfenyylibutyraatti; Sodium, phénylbutyrate de; Sodyum Fenilbutirat. Sodium 4-Phenylbutyrate.

$C_{10}H_{11}NaO_2$ = 186.2.

CAS — 1716-12-7.

ATC — A16AX03.

ATC Vet — QA16AX03.



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

Ph. Eur. 6.2 (Sodium Phenylbutyrate). A white or yellowish-white powder. Freely soluble in water and in methyl alcohol; practically insoluble in dichloromethane. A 2% solution in water has a pH of 6.5 to 7.5.

Profile

Sodium phenylbutyrate is a prodrug for sodium phenylacetate (see above) and is used as adjunctive treatment of hyperammonaemia in patients with urea cycle disorders (p.1929). It is given orally in equally divided doses with meals. The total daily dose for patients weighing under 20 kg is 450 to 600 mg/kg, and for those weighing over 20 kg, 9.9 to 13.0 g/m^2.

Sodium phenylbutyrate is also under investigation for the treatment of some sickle-cell disorders (p.1044) and for use as a potential differentiation-inducing agent in malignant glioma and acute myeloid leukaemia. Sodium phenylbutyrate is also under investigation for spinal muscular atrophy, which is caused by homozygous absence of the SMN1 gene, after reports that it significantly increased SMN transcript expression in both fibroblast cultures and leucocytes from these patients.

◊ References.

1. Batshaw ML, *et al.* Alternative pathway therapy for urea cycle disorders: twenty years later. *J Pediatr* 2001; **138** (suppl 1): S46–S55. Correction. *ibid.* 2002; **140:** 490.
2. Mercuri E, *et al.* Randomized, double-blind, placebo-controlled trial of phenylbutyrate in spinal muscular atrophy. *Neurology* 2007; **68:** 51–5.
3. Caruthers RL, Johnson CE. Stability of extemporaneously prepared sodium phenylbutyrate oral suspensions. *Am J Health-Syst Pharm* 2007; **64:** 1513–15.

Preparations

Proprietary Preparations (details are given in Part 3)

Cz.: Ammonaps; ***Fr.:*** Ammonaps†; ***Ger.:*** Ammonaps†; ***Ital.:*** Ammonaps; ***Neth.:*** Ammonaps; ***Pol.:*** Ammonaps; ***Port.:*** Ammonaps; ***Spain:*** Ammonaps; ***UK:*** Ammonaps; ***USA:*** Buphenyl.

Sodium Polymetaphosphate

E452 (sodium polyphosphates); Polimetafosfato de sodio.

CAS — 50813-16-6.

NOTE. Although Sodium hexametaphosphate has been used as a synonym for the polymetaphosphate, the latter also exists in much higher degrees of polymerisation.

Profile

Sodium polymetaphosphate has been used as a 5% dusting powder in hyperhidrosis and bromhidrosis, and as a prophylactic against athlete's foot.

Sodium polymetaphosphate combines with calcium and magnesium ions to form complex soluble compounds and is used as a water softener.

Sodium Pyrophosphate *(USAN)*

Sodu pirofosforan; Tetrasodium Pyrophosphate; TSPP.

$Na_4P_2O_7$ = 265.9.

CAS — 7722-88-5.

Profile

Sodium pyrophosphate acts as a calcium chelator and is used in products for dental care to reduce tartar formation. It is also used as a food additive, and as a water softener in detergents and for industrial applications. Potassium pyrophosphate (tetrapotassium pyrophosphate) and sodium acid pyrophosphate (disodium pyrophosphate) are used similarly.

Sodium pyrophosphate is also used in kits for the preparation of technetium-99m pyrophosphate.

Preparations

Proprietary Preparations (details are given in Part 3)

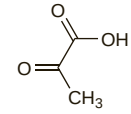
Multi-ingredient: ***Arg.:*** Esmedent Dientes Sens Blanq + Ctrol Sarro; Fluordent PX; Odol Control Sarro†; ***Braz.:*** Malvatricin Antiplaca; ***Chile:*** FKD; ***Ital.:*** AZ Tartar Control; ***USA:*** Plax.

Sodium Pyruvate

Piruvato de sodio. Sodium α-ketopropionate; sodium 2-oxopropanoate.

$C_3H_4NaO_3$ = 111.1.

CAS — 127-17-3 (pyruvic acid); 113-24-6 (sodium pyruvate).



(pyruvic acid)

Profile

Sodium pyruvate has been given intravenously in the diagnosis of disorders of pyruvate metabolism.

◊ Relative serum concentrations of lactate and pyruvate after a 10-minute intravenous infusion of sodium pyruvate 500 mg/kg have been used as an aid to the diagnosis of disorders of pyruvate metabolism.[1] Death shortly after pyruvate loading in a 9-year-old child with restrictive cardiomyopathy suggests that the test should not be performed when cardiac function is decreased.[2]

1. Dijkstra U, *et al.* Friedreich's ataxia: intravenous pyruvate load to demonstrate a defect in pyruvate metabolism. *Neurology* 1984; **34:** 1493–7.
2. Matthys D, *et al.* Fatal outcome of pyruvate loading test in child with restrictive cardiomyopathy. *Lancet* 1991; **338:** 1020–1.

Sodium Silicate

Silicato de sodio; Soluble Glass; Water Glass.

CAS — 1344-09-8.

Profile

Concentrated aqueous solutions of sodium silicate are commercially available and have many industrial uses. The solutions vary in composition, viscosity, and density; the greater the ratio of Na_2O to SiO_2 the more tacky and alkaline the solution.