

2 0 T H E D I T I O N

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# Remington: The Science and Practice of Pharmacy

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congeals at a temperature not lower than 15.6°, corresponding to a minimum of 99.4% of  $\text{CH}_3\text{COOH}$ ; specific gravity about 1.05.

**Solubility**—Miscible with water, alcohol, acetone, ether, or glycerin; insoluble in carbon tetrachloride or chloroform.

**Uses**—A *caustic* and *vesicant* when applied externally and is often sold under various disguises as a *corn solvent*. It is an excellent solvent for fixed and volatile oils and many other organic compounds. It is used primarily as an *acidifying agent*.

## ALUMINUM

Aluminum Al (26.98); the free metal in the form of finely divided powder. It may contain oleic acid or stearic acid as a lubricant. It contains not less than 95% Al and not more than 5% *Acid-insoluble substances*, including any added fatty acid.

**Description**—Very fine, free-flowing, silvery powder free from gritty or discolored particles.

**Solubility**—Insoluble in water or alcohol; soluble in hydrochloric and sulfuric acids or in solutions of fixed alkali hydroxides.

**Uses**—A *protective*. An ingredient in *Aluminum Paste*.

## ALUMINUM MONOSTEARATE

### Aluminum, dihydroxy(octadecanoato-O)-,

Dihydroxy(stearato)aluminum [7047-84-9]; a compound of aluminum with a mixture of solid organic acids obtained from fats, and consists chiefly of variable proportions of aluminum monostearate and aluminum monopalmitate. It contains the equivalent of 14.5 to 16.5% of  $\text{Al}_2\text{O}_3$  (101.96).

**Preparation**—By interaction of a hydroalcoholic solution of potassium stearate with an aqueous solution of potassium alum, the precipitate being purified to remove free stearic acid and some aluminum distearate simultaneously produced.

**Description**—Fine, white to yellowish white, bulky powder; faint, characteristic odor.

**Solubility**—Insoluble in water, alcohol, or ether.

**Uses**—A *pharmaceutical necessity* used in the preparation of *Sterile Procaine Penicillin G with Aluminum Stearate Suspension*.

## STRONG AMMONIA SOLUTION

### Stronger Ammonia Water; Stronger Ammonium Hydroxide Solution; Spirit of Hartshorn

Ammonia [1336-21-6]; a solution of  $\text{NH}_3$  (17.03), containing 27.0 to 31.0% (w/w) of  $\text{NH}_3$ . Upon exposure to air it loses ammonia rapidly.

**Caution**—Use care in handling it because of the *caustic nature of the Solution and the irritating properties of its vapor*. Cool the container well before opening, and cover the closure with a cloth or similar material while opening. Do not taste it, and avoid inhalation of its vapor.

**Preparation**—Ammonia is obtained commercially chiefly by synthesis from its constituent elements, nitrogen and hydrogen, combined under high pressure and at high temperature in the presence of a catalyst.

**Description**—Colorless, transparent liquid; exceedingly pungent, characteristic odor; even when well diluted it is strongly alkaline to litmus; specific gravity about 0.90.

**Solubility**—Miscible with alcohol.

**Uses**—Only for chemical and pharmaceutical purposes. It is used primarily in making ammonia water by dilution and as a chemical reagent. It is too strong for internal administration. It is an ingredient in *Aromatic Ammonia Spirit*.

## BISMUTH SUBNITRATE

### Basic Bismuth Nitrate; Bismuth Oxynitrate; Spanish White; Bismuth Paint; Bismuthyl Nitrate

Bismuth hydroxide nitrate oxide [1304-85-4]  $\text{Bi}_5\text{O}(\text{OH})_9(\text{NO}_3)_4$  (1461.99); a basic salt that, dried at 105° for 2 hr, yields upon ignition not less than 79% of  $\text{Bi}_2\text{O}_3$  (465.96).

**Preparation**—A solution of bismuth nitrate is added to boiling water to produce the subnitrate by hydrolysis.

**Description**—White, slightly hygroscopic powder; suspension in distilled water is faintly acid to litmus (pH about 5).

**Solubility**—Practically insoluble in water or organic solvents; dissolves readily in an excess of hydrochloric or nitric acid.

**Incompatibilities**—Slowly hydrolyzed in water with liberation of nitric acid; thus, it possesses the incompatibilities of the acid. *Reducing agents* darken it with the production of metallic bismuth.

**Uses**—A *pharmaceutical necessity* in the preparation of milk of bismuth. It also is used as an *astringent*, *adsorbent*, and *protective*; however, its value as a protective is questionable. This agent, like other insoluble bismuth salts, is used topically in lotions and ointments.

## BORIC ACID

### Boric Acid ( $\text{H}_3\text{BO}_3$ ); Boracic Acid; Orthoboric Acid

Boric acid [10043-35-3]  $\text{H}_3\text{BO}_3$  (61.83).

**Preparation**—Lagoons of the volcanic districts of Tuscany formerly furnished the greater part of this acid and borax of commerce. Borax is now found native in California and some of the other western states; calcium and magnesium borates are found there also. It is produced from native borax or from the other borates by reacting with hydrochloric or sulfuric acid.

**Description**—Colorless scales of a somewhat pearly luster, or crystals, but more commonly a white powder slightly unctuous to the touch; odorless and stable in the air; volatilizes with steam.

**Solubility**—1 g in 18 mL water, 18 mL alcohol, 4 mL glycerin, 4 mL boiling water, or 6 mL boiling alcohol.

**Uses**—A buffer, and it is this use that is recognized officially. It is a very weak *germicide* (*local anti-infective*). Its nonirritating properties make its solutions suitable for application to such delicate structures as the cornea of the eye. Aqueous solutions are employed as an eye wash, mouth wash, and for irrigation of the bladder. A 2.2% solution is isotonic with lacrimal fluid. Solutions, even if they are made isotonic, will hemolyze red blood cells. It also is employed as a dusting powder, when diluted with some inert material. It can be absorbed through irritated skin, eg, infants with diaper rash.

Although it is not absorbed significantly from intact skin, it is absorbed from damaged skin and fatal poisoning, particularly in infants, has occurred with topical application to burns, denuded areas, granulation tissue, and serous cavities. *Serious poisoning can result from oral ingestion* of as little as 5 g. Symptoms of poisoning are nausea, vomiting, abdominal pain, diarrhea, headache, and visual disturbance. Toxic alopecia has been reported from the chronic ingestion of a mouth wash containing it. The kidney may be injured, and death may result. Its use as a preservative in beverages and foods is prohibited by national and state legislation. *There is always present the danger of confusing it with dextrose when compounding milk formulas for infants. Fatal accidents have occurred.* For this reason boric acid in bulk is colored, so that it cannot be confused with dextrose.

It is used to prevent discoloration of physostigmine solutions.

## CALCIUM HYDROXIDE

### Slaked Lime; Calcium Hydrate

Calcium hydroxide [1305-62-0]  $\text{Ca}(\text{OH})_2$  (74.09).

**Preparation**—By reacting freshly prepared calcium oxide with water.

**Description**—White powder; alkaline, slightly bitter taste; absorbs carbon dioxide from the air, forming calcium carbonate; solutions exhibit a strong alkaline reaction.

**Solubility**—1 g in 630 mL water or 1300 mL boiling water; soluble in glycerin or syrup; insoluble in alcohol; the solubility in water is decreased by the presence of fixed alkali hydroxides.

**Uses**—In the preparation of *Calcium Hydroxide Solution*.

## CALCIUM HYDROXIDE TOPICAL SOLUTION

### Calcium Hydroxide Solution; Lime Water

A solution containing, in each 100 mL, not less than 140 mg of  $\text{Ca}(\text{OH})_2$  (74.09).

**Note**—The solubility of calcium hydroxide varies with the temperature at which the solution is stored, being about 170 mg/100 mL at 15° and less at a higher temperature. The official concentration is based upon a temperature of 25°.

**Preparation**—

Calcium Hydroxide .....	3 g
Purified Water .....	1000 mL

Add the calcium hydroxide to 1000 mL of cool, purified water, and agitate the mixture vigorously and repeatedly during 1 hr. Allow the excess calcium hydroxide to settle. Dispense only the clear, supernatant liquid.

The undissolved portion of the mixture is not suitable for preparing additional quantities of the solution.

The object of keeping lime water over undissolved calcium hydroxide is to ensure a saturated solution.

**Description**—Clear, colorless liquid; alkaline taste; strong alkaline reaction; absorbs carbon dioxide from the air, a film of calcium carbonate forming on the surface of the liquid; when heated, it becomes turbid, owing to the separation of calcium hydroxide, which is less soluble in hot than in cold water.

**Uses**—Too dilute to be effective as a gastric antacid. It is employed *topically* as a *protective* in various types of lotions. In some lotion formulations it is used with olive oil or oleic acid to form calcium oleate,