28.28 - Hypochlorites; commercial calcium hypochlorite; chlorites; hypobromites.

2828.10 - Commercial calcium hypochlorite and other calcium hypochlorites

2828.90 - Other

Subject to the **exclusions** specified in the introduction to this sub-Chapter, this heading covers hypochlorites, chlorites and hypobromites of metals and commercial calcium hypochlorite.

(A) HYPOCHLORITES

These are the most important; they are mainly used for bleaching (" bleaching chlorites "). They are unstable salts, which deteriorate in the air; they give hypochlorous acid on contact even with weak acids. Hypochlorous acid, readily giving off chlorine, is a very powerful oxidising and bleaching agent.

(1) **Sodium hypochlorite** ($NaClO.6H_2O$). Put up in aqueous solutions, is nowadays commercially known as " eau de Javel ". It is prepared by electrolysing an aqueous solution of sodium chloride, or by the action of sodium sulphate or sodium carbonate on calcium hypochlorite, or by treating sodium hydroxide (caustic soda) with chlorine. This salt, very soluble in water, does not exist in the anhydrous state; it is rather unstable and sensitive to heat and light. Aqueous solutions of sodium hypochlorite are colourless or yellowish, smelling of chlorine. They generally contain as impurities a small quantity of sodium chloride. Used for bleaching vegetable fibres or wood pulp, disinfecting premises, purifying water or preparing hydrazine. It is also used in photography as a rapid developer for antihalation plates, and in medicine as an antiseptic (mixed with boric acid, it is known as Dakin's solution).

(2) **Potassium hypochlorite** ($KClO.6H_2O$). The aqueous solution of this salt was previously known as " eau de Javel "; it is similar in all respects to the sodium compound.

(3) **Other hypochlorites**. These include hypochlorites of ammonium (a disinfectant more powerful than calcium hypochlorite), of barium, of magnesium or of zinc; all are bleaching agents or disinfectants.

(B) COMMERCIAL CALCIUM HYPOCHLORITE

Calcium hypochlorite. The product, improperly known in commerce as " chloride of lime ", consists mainly of impure calcium hypochlorite and calcium chloride and, sometimes, calcium oxide or hydroxide. It is obtained by saturating calcium hydroxide with chlorine. It is a white, amorphous, powdery substance, hygroscopic when containing calcium chloride, soluble in water, and sensitive to the action of light, heat and carbon dioxide. It affects animal fibres and organic matter, and destroys colouring matter. It is used for bleaching vegetable textiles or wood pulp, as a disinfectant or antiseptic (to purify water by " javellisation "), for spreading over ground contaminated by lethal gases. Pure calcium hypochlorite occurs in crystalline masses or in solutions smelling of chlorine; it is slightly more stable than the impure product.

Calcium chloride ($CaCl_2$) is **excluded** (**heading 28.27**).

(C) **CHLORITES**

This group covers the salts of chlorous acid ($HClO_2$) :

(1) **Sodium chlorite** ($NaClO_2$). Anhydrous or hydrated (with 3 H_2O) masses, or aqueous solutions. Stable up to 100 °C. Powerful oxidising agent, very corrosive. Used in dyeing or bleaching.

(2) **Aluminium chlorite**. Same uses as sodium chlorite.

(D) **HYPOBROMITES**

This group covers the salts of hypobromous acid (HBrO) (heading 28.11).

Potassium hypobromite is used for measuring the nitrogen content of certain organic compounds.