

## 28.53

**28.53 - Phosphides, whether or not chemically defined, excluding ferrophosphorus; other inorganic compounds (including distilled or conductivity water and water of similar purity); liquid air (whether or not rare gases have been removed); compressed air; amalgams, other than amalgams of precious metals.**

2853.10 - Cyanogen chloride (chlorcyan)

2853.90 - Other

### (A) PHOSPHIDES, WHETHER OR NOT CHEMICALLY DEFINED, EXCLUDING FERROPHOSPHORUS

Phosphides are compounds of phosphorus with another element.

The most important of the phosphides falling here are obtained by direct action of the constituent elements; they include :

- (1) **Copper phosphide** (cuprophosphorus, phosphor copper). Produced in a reverberatory furnace or in a crucible. Usually in yellowish-grey masses or in small, very brittle ingots of crystalline structure. The heading covers copper phosphide and master alloys of copper **only** if they contain more than 15 % by weight of phosphorus. Under this limit they fall generally in **Chapter 74**. Copper phosphide is a very good deoxidiser of copper, increasing the hardness of that metal; it improves the fluidity of molten metal, and is used in the manufacture of phosphor bronzes.
- (2) **Calcium phosphide** ( $\text{Ca}_3\text{P}_2$ ). Small chestnut-coloured crystals or grey granular masses which, on contact with water, give off hydrogen phosphides which ignite spontaneously. Used with calcium carbide for naval signals (self-igniting flares for buoys).
- (3) **Zinc phosphide** ( $\text{Zn}_3\text{P}_2$ ). Grey, poisonous powder with a vitreous fracture; gives off phosphine and deteriorates in moist air. Used for destroying rodents and locusts, and also in medicine (instead of phosphorus).
- (4) **Tin phosphide**. A very brittle silvery-white solid. Used in making alloys.
- (5) **Other phosphides**, e.g., hydrogen phosphides (solid, liquid, gaseous), and the phosphides of arsenic, boron, silicon, barium, cadmium.

This heading **excludes** :

- (a) Compounds of phosphorus with oxygen (**heading 28.09**), with halogens (**heading 28.12**) or with sulphur (**heading 28.13**).
- (b) Platinum and other precious metal phosphides (**heading 28.43**).
- (c) Ferrophosphorus (iron phosphide) (**heading 72.02**).

### (B) DISTILLED AND CONDUCTIVITY WATER AND WATER OF SIMILAR PURITY

The heading covers **only** distilled water, re-distilled or electro-osmotic water, conductivity water and water of similar purity, including water treated with ion exchange media.

Natural water, even if filtered, sterilised, purified or softened, is **excluded** (**heading 22.01**). When put up as a medicament in measured doses or in packings for retail sale, water falls in **heading 30.04**.

**(C) MISCELLANEOUS INORGANIC COMPOUNDS**

Inorganic chemical products not elsewhere specified or included are also included in this heading (including certain compounds of carbon listed in Chapter Note 2).

The heading includes :

- (1) **Cyanogen and halogen compounds of cyanogen**, e.g., cyanogen chloride (chlorcyan) ( $\text{CNCl}$ ) **cyanamide and its metal derivatives (other than calcium cyanamide (heading 31.02 or 31.05))**.
- (2) **Non-metallic oxysulphides** (of arsenic, carbon, silicon) and **non-metallic chlorosulphides** (of phosphorus, carbon, etc.). Thiophosgene ( $\text{CSCl}_2$ ) (thiocarbonyl chloride, carbon dichlorosulphide) obtained by the action of chlorine on carbon disulphide, is a red liquid, suffocating and lachrymatory, decomposed by water, used in organic synthesis.
- (3) **Alkali amides**. Sodamide or sodium amide ( $\text{NaNH}_2$ ) is obtained by the action of heated ammonia on a sodium-lead alloy, or by passing ammonia in the gaseous state over molten sodium. Pinkish or greenish crystalline masses, decomposed by water. Used in organic synthesis, in the preparation of azides, cyanides, etc.

There are also potassium and other metal amides.

- (4) **Phosphonium iodide**. Obtained, for example, by the interaction of phosphorus, iodine and water; it is a reducing agent.
- (5) **Trichlorosilane** ( $\text{SiHCl}_3$ ). Obtained by the reaction of hydrogen chloride ( $\text{HCl}$ ) with silicon, it is used in the manufacture of fumed silica and very pure silicon.

**(D) LIQUID AIR AND COMPRESSED AIR**

In commerce, liquefied air is presented in steel or brass vacuum-jacketed containers. It can cause severe burns and renders soft organic materials brittle. It is used for obtaining oxygen, nitrogen and rare gases by fractional distillation. Because of its rapid evaporation, it is used in laboratories as a refrigerating agent. Mixed with charcoal and other products it constitutes a powerful explosive used in mining.

This heading also includes :

- (1) Liquid air from which rare gases have been removed.
- (2) Compressed air.

**(E) AMALGAMS, EXCEPT AMALGAMS OF PRECIOUS METALS**

Mercury forms amalgams with several base metals (alkali metals and alkaline-earth metals, zinc, cadmium, antimony, aluminium, tin, copper, lead, bismuth, etc.). Amalgams can be obtained : by direct action of the metals with mercury; by electrolysis of the metal salts using a mercury cathode; or by electrolysis of a mercury salt (the cathode being of the metal).

Amalgams obtained by electrolysis and distilled at a low temperature are used to prepare pyrophoric metals more reactive than those obtained at high temperature. They are also used in the metallurgy of precious metals.

- (1) **Amalgams of alkali metals** decompose water with the production of less heat than the pure metals; they are therefore more active reducing agents than the latter. **Sodium amalgam** is used in the preparation of hydrogen.
- (2) **Aluminium amalgam** is used as a reducing agent in organic synthesis.
- (3) **Copper amalgam** containing a small added quantity of tin is used in dentistry. Copper amalgams are metallic cements, becoming soft when heated, suitable for moulding and for repairing china.
- (4) **Zinc amalgam** is used in batteries to prevent corrosion.
- (5) **Cadmium amalgam** is used in dentistry and in the manufacture of tungsten wire from sintered metal.
- (6) **Antimony-tin amalgam** is used for "bronzing" plaster.

Amalgams containing precious metals, whether or not associated with base metals, are **excluded** (heading 28.43). Mercury compounds, whether or not chemically defined, other than amalgams fall in heading 28.52.

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