28.50 - Hydrides, nitrides, azides, silicides and borides, whether or not chemically defined, other than compounds which are also carbides of heading 28.49.

The four groups of compounds covered by this heading each contain two or more elements, one of which is described by the term used (hydrogen, nitrogen, silicon or boron), the others being non-metals or metals.

(A) HYDRIDES

The most important hydride is calcium hydride (CaH_2) (hydrolith) obtained by direct combination of its elements; white masses with a crystalline fracture, decomposing in the cold on contact with water and giving off hydrogen. It is a reducing agent used for producing sintered chromium from chromic chloride.

There are also hydrides of arsenic, silicon, boron (including sodium borohydride), lithium (and aluminium-lithium), sodium, potassium, strontium, antimony, nickel, titanium, zirconium, tin, lead, etc.

This heading **does not include** compounds of hydrogen with the following elements : oxygen (**headings 22.01**, **28.45**, **28.47** and **28.53**), nitrogen (**headings 28.11**, **28.14** and **28.25**), phosphorus (**heading 28.48**), carbon (**heading 29.01**), and certain other non-metals (**headings 28.06** and **28.11**). Palladium hydrides and other precious metal hydrides fall in **heading 28.43**.

(B) NITRIDES

(1) **Non-metal nitrides**. Boron nitride (BN) is a light white powder, highly refractory. A heat and electricity insulator; used for lining electric ovens or for the manufacture of crucibles. Silicon nitride (Si_3N_4) is a greyish-white powder.

(2) **Metal nitrides**. Aluminium, titanium, zirconium, hafnium, vanadium, tantalum or niobium nitrides are obtained either by heating the pure metal in nitrogen at a temperature of 1,100 °C or 1,200 °C, or by heating at a higher temperature a mixture of oxide and carbon in a current of nitrogen or ammonia gas.

This heading **does not cover** combinations of nitrogen with the following elements : oxygen (**heading 28.11**), halogens (**heading 28.12**), sulphur (**heading 28.13**), hydrogen (**heading 28.14**), carbon (**heading 28.53**). Silver nitrides and other precious metal nitrides fall in **heading 28.43**, thorium and uranium nitrides in **heading 28.44**.

(C) AZIDES

Metal azides can be regarded as salts of hydrazoic acid (HN_3).

(1) **Sodium azide** (NaN_3). Obtained by action of nitrous oxide on sodium amide, or from hydrazine, ethyl nitrite and sodium hydroxide; colourless crystalline flakes. Soluble in water, deteriorates slightly in humid atmosphere. Strongly affected by the carbon dioxide in the air. It is sensitive to shock, like mercury fulminate, but less sensitive to heat than the latter. Used for preparing primer explosives for detonators.

(2) **Lead azide** (PbN_6). Obtained from sodium azide and lead acetate. White crystalline powder, very sensitive to shock, preserved under water. Used instead of mercury fulminate as an explosive.

(D) **SILICIDES**

(1) **Calcium silicide**. Very hard, grey, crystalline masses. Used in metallurgy, for local production of hydrogen, and in the manufacture of smoke bombs.

(2) **Chromium silicides**. There are several chromium silicides; these are very hard substances used as abrasives.

(3) **Copper silicide** (**other than** copper silicon master alloys of **heading 74.05**). Usually in brittle plates. Reducing agent for refining copper, facilitating its moulding and increasing its hardness and resistance to rupture; it decreases the tendency of copper alloys to corrode. Also used in the manufacture of silicon bronze or of nickel-copper alloys.

(4) **Magnesium or manganese silicides**.

This heading **does not cover** combinations of silicon with the following elements : oxygen (**heading 28.11**), halogens (**heading 28.12**), sulphur (**heading 28.13**), phosphorus (**heading 28.48**). Carbon silicide (silicon carbide) falls in **heading 28.49**, platinum and other precious metal silicides in **heading 28.43**, ferro-alloys and master alloys containing silicon in **heading 72.02** or **74.05**, and aluminium-silicon alloys in **Chapter 76**. See paragraph (A) above for combinations of silicon and hydrogen.

(E) **BORIDES**

(1) **Calcium boride** (CaB_6). Obtained by electrolysing a mixture of a borate and calcium chloride; dark crystalline powder. A powerful reducing agent used in metallurgy.

(2) **Aluminium boride**. Obtained in an electric furnace; crystalline masses. Used in the manufacture of glass.

(3) **Titanium, zirconium, vanadium, niobium, tantalum, molybdenum and tungsten borides** are obtained by heating mixtures of metal powder and of pure boron powder in a vacuum at a temperature of 1,800 °C to 2,200 °C, or by treating vaporised metal with boron. These products are very hard and are good conductors of electricity. They are used in hard sintered compositions.

(4) **Magnesium, antimony, manganese, and iron borides, etc**.

This heading **does not include** compounds of boron with the following elements : oxygen (**heading 28.10**), halogens (**heading 28.12**), sulphur (**heading 28.13**), precious metals (**heading 28.43**), phosphorus (**heading 28.48**), carbon (**heading 28.49**). See paragraphs (A), (B) and (D) above for combinations with hydrogen, nitrogen or silicon.

The heading **excludes** copper-boron master alloys (see the Explanatory Note to **heading 74.05**).