

Safety precautions in titanium powder reduction process

Many wastes will be generated in **titanium powder metallurgy**, which will cause serious corrosion to the devices and buildings and is harmful to human body. Therefore, we should pay enough attention to deal with wastes of titanium metallurgy, comprehensively utilize waste for profits as well as protect environment and improve labor sanitary condition, which can be greatly related to the workers' health.

As metal sodium, sodium powder and **titanium powder** that used in the sodium reduction process as well as magnesium powder and titanium powder that used in the magnesium reduction process all belong to the flammable and combustible substance, safety measures should be taken to prevent fire and blast.

In the reduction process, sodium powder, magnesium powder and titanium powder can rub and burn automatically and release a lot of heat. These kinds of dust are existed in the air, which will cause blast when accumulated to a certain concentration range. The lowest explosion concentration of magnesium powder in the air is 30mg/l and the titanium powder is 0.036mg/l, therefore, we should take special care when dealing with metal sodium and titanium sponge that contains these kinds of dust. Clean the workshops regularly that contain titanium powder so as to prevent the dust accumulation and blast. When fetching the titanium sponge that produced by magnesium reduction process, it will rub and burn aromatically and even burn up titanium lump as the wall climbing titanium is adhered with a large number of magnesium chloride and magnesium powder. Therefore, before fetching it, it is best to wipe out the wall climbing titanium. In crashing, packaging and transporting operations, titanium that contains cuttings should be handled

with care and should not be stored in plastic cask and metal drum that lined with plastic.

Once titanium powder and titanium sponge catch fire, put out fire with argon gas asbestos cloth and sand instead of using water, carbon dioxide, carbon tetrachloride and other fire extinguishing agents; separate titanium sponge which has burned from those unburned. Set fire shield beside the place where the magnesium powder is fetched. Equip fire apparatus in the crushing, mixing and packaging operating post of **magnesium powder** products as well as drying, mixing and packaging operating post of sodium powder products.

Keep metal sodium, sodium powder and liquid sodium away from water, as sodium will have intense hydrolysis reaction and blast at the same time when contacting with water. Therefore, sodium should be away from water when being processed and the equipment used should keep dry. When cleaning the container and pipeline that contain sodium, it is necessary to confirm that no sodium exists before washing with water. Avoid processing sodium in the damp places. Containers, pipelines and valves that fill sodium should be strictly checked with leakage detecting and transport the liquid sodium only when they are sealed well so as to avoid the accidents caused by the leakage of liquid sodium.

In the operating post where sodium is existed, the operating personnel should wear labor protection products so as to avoid burn caused by the spatter of liquid sodium. Once the burn accidents happened, remove the sodium that is adhered to the human body and clean the injury with cloth, wash with boric acid in time or send to the hospital.

The transport and storage of titanium tetrachloride should be conducted in the sealing system. If someone has to work in the atmosphere, he should wear antigas mask, rubber gloves, thigh boots and other labor protection appliances instead of exposing skin as titanium tetrachloride will hydrolyze and

generate a lot of hydrochloric acid when contacting with water or the atmosphere. Keep the air flow in the operating room so as to prevent human poisoning and burns.