is rapidly decomposed by water into a mixture of hydrochloric and sulfuric acids For precautions for handling it, see *Sulfuric acid*

Chlorowaxes are chlorinated naphthalenes and chlorinated diphenyls, used primarily as electrical insulating waxes with other minor industrial uses. They may vary from liquids of fairly low chlorine content, commonly used in transformer oils, to hard waxes of high chlorine content. Their toxicity increases with chlorine content. There is some indication that toxicity tapers off on either end with the maximum toxicity around 50 per cent chlorine in the case of the chlorinated diphenyls All of them have a very low volatility, but when heated give off harmful vapors.

These waxes have two distinctly different effects and either or both may appear. They produce a severe acneform dermatitis by contact with the skin and, if inhaled, may cause liver injury.

See Industrial Data Sheet 307.

Chromic acid is a strong oxidizing agent but not a strong acid. The oxidizing character of the material is so strong that it will ignite ethyl alcohol and similar liquids by contact and char wood, straw, and similar materials, although they do not ordinarily ignite It should be isolated from materials which can be easily oxidized, although chromic acid itself is not a fire hazard Empty containers should not be discarded until thoroughly washed with water. Fires have occurred when cans that contained chromic acid were used for waste or trash.

Chromic acid is both poisonous and irritating to the skin Precautions should be taken against skin contact with the solid or its solutions and against inhalation of dust from the solid or of mist from the solutions.

The major hazard to health in the handling of chromic acid and chromates has always been considered to be inhalation of the mist from chromic acid plating tanks It causes nasal irritation and perforation of the nasal septum. There have been reports of industrial poisoning from inhalation of the mist of solutions as dilute as 5 per cent chromic acid

An exceptionally high rate of lung cancer in the chromate-producing industry has been reported. The crude death rate from lung cancer was 25 times that to be expected in the average nonchromate-producing industry If cancers of the lung are excluded, then the ratio of deaths from other cancers becomes 12 4 per cent for the chromate industry as compared with 15 per cent for a similar industrial group

There is some evidence that cancer of the lung is produced only by the monochromates and not by bichromates or chromic acid, but this question is still under study The occurrence of irritation of the nasal passages has no necessary relation to the occurrence of lung cancer

Since chromic acid is irritant to the upper respiratory passages, it should also be irritant to the lungs if it is inhaled and retained. There is some evidence that this can happen, at least with dilute solutions and at high concentrations of the mist

See *Hygienic Guide.*

Cobalt is a metal chemically similar to iron and nickel and is used as an alloying element and as the cement in carbide tools. Both cobalt and nickel are materials which can and occasionally do cause hypersensitization types of dermatitis in individuals who are susceptible. It has been suggested that some cases of pneumoconiosis in the carbide tool industry may also be cases of allergy to cobalt.

Animal studies have indicated that particulate cobalt metal is an acutely irritating substance when introduced into guinea pig lungs in 50 mg and 25 mg doses. Studies also indicated that a single dose of 5 mg was not lethal to the animal but that repeated doses of such magnitude were lethal Industrial exposure to cobalt, possibly combined with certain metal carbides and small amounts of silica, is capable of producing serious pneumoconiosis which is initially of an insidious nature.

Copper, in small amounts, is indispensable to life and is not harmful Relatively large doses (10 to 20 gm) have an acute toxic action when taken orally.

Inhalation of copper dust has been reported to cause changes in the gums and mucous membrane lining of the mouth This is probably local action directly on the tissue rather than general toxicity. Copper fumes, as produced in inert gas shielded arc welding, cause a condition somewhat similar to