

## Antimony and derivatives thereof

### Definition of causal agent

Antimony is a silver-white, brittle metal with no significant use in its unalloyed state. Its inorganic and organic compounds include antimony tripentoxide, antimony tri-pentasulfide, antimony trichloride, antimony potassium tartrate and sodium antimony dimercaptosuccinate.

### *Main occupational uses and sources of exposure:*

Antimony extraction and refining; alloys (lead, copper, tin) especially in the production and disposal of lead acid storage batteries, solder, bearings, type metal, ammunition and cable sheathing. High-purity antimony is used as a dopant in semiconductors. Intermetallic compounds of antimony such as aluminum antimonide, gallium antimonide and indium antimonide are used for thermoelectric devices.

Antimony trioxide is used as a fire retardant for plastics, textiles, rubber, adhesives, pigments, and paper. Antimony is used in glass, ceramic and enamel industries, in rubber and plastic manufacture, as a paint pigment and in the making of fireworks and matches.

### Toxic or irritant effects

#### Irritant

- Antimony and its inorganic compounds are irritating to the skin, eyes and respiratory tract. Repeated contact may cause a papular or pustular skin rash in areas where sweating occurs.
- Intense exposure to vapours may induce perforation of the nasal septum or pulmonary oedema.  
Repeated exposure to antimony oxides may cause orange staining of the teeth

#### **Pneumoconiosis (stibiosis):**

Chronic exposure to antimony trioxide may, rarely, induce a benign ('overload') pneumoconiosis which is usually asymptomatic. Fibrosis does not occur.

*minimum intensity of exposure:* unknown but well above 0.5mg/m<sup>3</sup>.

*minimum duration of exposure:* six months

*maximum latent period:* none

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## Stibine (antimony hydride)

### Definition of causal agent

Stibine is a colourless gas that can be formed when nascent hydrogen comes into contact with metallic antimony, when some antimony compounds come into contact with acid or in the case of electrolytic processing, including battery charging.

#### *Main occupational uses and sources of exposure:*

Stibine is used as a dopant in the microelectronics industry and as a fumigating agent (mainly in the past). [A dopant is an agent added to a semiconductor lattice in low concentrations in order to alter the optical/electrical properties of the semiconductor.]

### Toxic effects

#### *1 Acute systemic effects*

#### **□ Haemolytic syndrome**

Stibine causes a rapid and severe Coombs-negative haemolytic anaemia. Main symptoms of stibine poisoning are: headache, asthenia, dizziness, abdominal cramps, nausea and vomiting, cardiovascular symptoms, and, in the most severe cases, jaundice and acute renal failure due to acute tubular necrosis.

#### *Respiratory irritation:*

Stibine may cause severe respiratory effects.

#### *Exposure criteria:*

*Minimum intensity of exposure:* occupational exposure confirmed, if possible assessed, by:

- History and study of working conditions showing evidence of acute exposure to stibine, at levels exceeding the established limit values
- And, if available:
  - Workplace air monitoring

*Minimum duration of exposure:* a few minutes to a few hours, depending on intensity of exposure.

*Maximum latent period:* 48 hours