

ANTIMONY – TRACE ELEMENT

Introduction

Atomic mass 122. Antimony is not an abundant metal but is present in many minerals typically as the sulphide. The metal is used as a minor alloy constituent that increases strength and hardness. Antimony is present in the lead alloy that is used in lead-acid storage batteries. Antimony is used in the semi-conductor, paint, glass and weapons industries. Organo-antimonials are used to treat parasitic diseases.

Exposure

Antimony is mainly encountered as an environmental contaminant associated with industrial sources. Normal environmental sources of the metal are very small with the exception of cigarette smoke and some dental materials that contain some antimony.

Absorption

No definitive information is available.

Distribution

Under normal conditions antimony distributes to lung, liver and kidney. Antimony may cross the placenta but does not seem to be preferentially excreted in breast milk.

Excretion

Antimony is excreted in urine and bile. There is evidence that after an initial rapid partial clearance some absorbed antimony remains in the body for many years.

Pathology

Industrial exposures are primarily to trivalent antimony compounds. Common manifestations of the exposure are ECG changes, chronic cardiac failure, pulmonary effects and local epithelium irritation. Pentavalent forms are generally less toxic. Stibine (SbH_3) is a highly toxic gas that causes central nervous system damage and is haemolytic. Because arsenic and antimony are commonly found together, and because they share similar chemistry profiles, the possibility of mixed exposures is a strong possibility. Pentavalent organo-antimony compounds used in medicine can cause muscle pain, joint stiffness, gut pain and ECG changes.

Monitoring

Blood and urine are the best available matrices for monitoring exposure. No defined correlations are available for pathology or critical organ concentrations, but elevated levels are suggestive of exposure that should be evaluated.

Treatment

No information is available.

Analysis

Hydride generation atomic absorption spectrometry and graphite furnace atomic absorption spectrometry have been used to determine antimony. PaLMS Trace Element Service uses inductively coupled plasma mass spectrometry for improved turn around time and quality of results.

For further information please contact Ross Wenzel, PaLMS Trace Elements on (02) 9926 7682 or email rwenzel@nsccahs.nsw.health.gov.au.