



IAOIA Mission

The Mission of the International Antimony Oxide Industry Association is to serve the common interests of antimony producers, users and other stake holders world-wide concerning the environmental, health and safety regulatory affairs concerning antimony substances and their uses. The activities of the IAOIA will be determined by its members, and may include the conducting studies, dissemination of information pertaining to the safety and benefits of antimony substances, and the development of scientific information for the submission to governmental agencies.

The IAOIA Website

The IAOIA is pleased to announce the start-up of our website. Please visit us at www.iaoia.org for future issues of this newsletter as well as a wealth of background information. The website is new and growing, so check it often.

Results of China Meeting

An antimony sub-association under China Chamber of Commerce of Metals, Minerals & Chemicals Importers & Exporters meeting was held in Guiyang, the capital city of Guizhou province in South China on June 25-26 of this year. Minmetals made a presentation on importance of the current activities of the IAOIA. They called for participation from Chinese industry.

The Chinese industry members recognize IAOIA is playing an important role, which will be beneficial to Chinese industry. But the members are not willing to pay the membership fees that are required to share equally in the high costs of the testing required to provide data for the current EU review of antimony oxide.

In theory anyone selling into the EU is required to provide data either individually or through participation in an organization. The problem of "Free Riders" forces responsible companies and their products to carry the burden of the testing costs.

The IAOIA is maintaining close contact in an effort to have the Chinese antimony association be a Full Member.

R53 Classification

Antimony trioxide is very insoluble in water. Therefore, the toxicity to fish and other aquatic organisms is very low. Resulting from the studies, performed in view of the Risk Assessment, the Swedish Rapporteur has concluded that antimony trioxide is not an acute or chronic ecotoxic. Therefore, antimony trioxide does not have to be labeled with R53 or any other R 50 phrase that indicates toxicity to the aquatic environment.

Antimony Trioxide FAQ:

Q: *What is antimony trioxide?*

A: Antimony is a naturally occurring elemental metal, and is found in group VA of the periodic table. It occurs in the tri- (+3) and pentavalent (+5) forms and is found in the earth's crust (average ca. 0.25 mg/kg) mostly associated with sulfur as stibnite. The manufacture of antimony trioxide (ATO) involves a sublimation reaction with oxygen that results in a cuboidal crystalline lattice formation.

Q: *What is it used for?*

A: The major use of ATO is as flame retardant synergist in plastics, paints, adhesives, sealant, rubber and textile back coatings where it is co-used with appropriate halogenated compounds usually chlorine or bromine based. ATO increases the flame-retardant effectiveness of the halogenated compound thereby minimizing its addition level. Without ATO synergists, around twice as much halogen compound would be needed to confer levels of flame retardancy required by legislation. Minor uses of ATO include: as polymerization catalyst used in PET resin manufacture (about 10%), as a frictional additive in automotive brake linings, as a clarifying aid in certain glasses, as a coating used on certain grades of TiO₂ pigments, as a stabilizer in certain pigments based on chromate's and molybdate's and as an opacifier in cast iron bath and sinking enameling.

Thousands of lives have been saved and tens of thousands of disfiguring burn injuries have been avoided by the use of antimony trioxide as a flame retardant synergist. Currently there is no known effective alternative to antimony trioxide in this application.

Q: *Antimony trioxide is classified as a 2(b) carcinogen by the International Agency for Research on Cancer (IARC) or category 3 carcinogen by the European Union (EU). Does this mean it causes cancer?*

A: The data in humans are inconclusive regarding the potential for lung cancer. In an occupational epidemiological study of a

cohort prior to 1960, workers were exposed to very high concentrations (up to 40 mg/m³) of antimony trioxide along with other known carcinogens, there seemed to be an increased risk for lung cancer, but this excess was not attributable to any particular agent. However, when data for workers in the same facility were re-examined for periods between 1961 - 1992, no excess risk was observed in a cohort recruited after 1960. In this study, which was reported in 1994, all the data were re-evaluated and it was also discovered that there was no evidence for a correlation between length of time worked and mortality from lung cancer. This suggests that even among the earlier exposed worker, no conclusive statement can be made regarding employment at the smelter and the incidence of lung cancer. Mammalian *in vivo* mutagenicity studies have produced negative results, therefore, this material is not considered to possess potential as a genotoxicant.

Existing experimental data indicates some concern that antimony may have the potential to induce carcinogenicity in the lungs of rats with long-term, high concentration exposures. The relevance of this data to humans is questionable since exposures of such magnitude as those in animal studies would be very unlikely. The carcinogenicity in this case seems to be related to decreased dust clearance and overloading of the lungs and subsequent inflammatory reaction. Also, the applicability of animal models to this type of exposure is also questionable given the known physiological differences in respiration and the respiratory system between humans and rodents.

A classification of 2 (b) by IARC or category 3 carcinogen by the EU, indicates that there is either "limited evidence of carcinogenicity in humans" or there is "inadequate evidence of carcinogenicity in humans".

Q: Given the information above, why does antimony trioxide need to be labeled with the R40 phrase "Limited evidence of a carcinogenic effect"?

A: This labeling is based on the potential "health hazards" associated with a chemical, not the practical "health risks". Even though there is very little "carcinogenic risk" associated with the exposure to antimony trioxide, a "potential hazard" has been identified at very high inhalation exposures.

Q: Is antimony comparable in toxicity to arsenic?

A: No, antimony is NOT SIMILAR in toxicity to arsenic, based on the available toxicology data. Arsenic is a known human carcinogen, it produces cancer in several organs and is genotoxic. Antimony has only been weakly associated with lung carcinogenicity, which could be attributed to the dust overloading and impaired clearance of the particulate.

Furthermore, the carcinogenic toxicity of Arsenic occurs at much lower doses than that of antimony. Arsenic produces liver and kidney toxicity as well as hematopoietic and immune system effects at high doses and the most sensitive effect in humans seems to be skin lesions which occur at doses as low as 0.014 mg/kg-day in drinking water. Antimony on the other hand does not produce adverse effects even at doses as high as 1879 mg/kg-day in a repeated-dose, 90-day oral study in rats. This means inorganic arsenic could be as much as 100,000x more toxic than antimony trioxide.

The arsenic present in antimony trioxide as an impurity, would only constitute an appreciable toxic hazard, if it was present as arsenic oxide or some other species soluble in stomach acids. However, studies have shown that arsenic can not be extracted from antimony trioxide, as the arsenic atoms replace antimony atoms in the antimony oxide crystals in a random fashion.

A complete list of FAQs can be found on our website.

The IAIOA Members

In the USA / Europe organization:

Campine
Great Lakes Chemical Company
Laurel Industries, Inc. (OxyChem)
Produits Chimiques de Lucette
Sica

In the Japan Mining Industry Association:

Nihon Seiko Co., Ltd.
Mikuni Smelting & Refining Co.
Nissan Chemical Industry, Ltd.
Sumitomo Metal Mining Co., Ltd.
Tohko Industrial Corp.

The IAIOA Associate Members

Albemarle Corporation
Dead Sea Bromine Group (DSBG)
Helm AG

Durr Marketing Associates, Inc.
Umicore Precious Metals

These are the responsible companies that are working very hard to ensure the antimony products are protected in the market place through proper response to all our government agencies and development and distribution of reliable data. These organization are sharing the costs, both financial and through employee time. By choosing to conduct your business with one of these companies you are supporting our industry. If you are a producer, distributor or consumer of antimony products and would like to contribute to these efforts, contact an IAIOA, JMIA office or one of our member companies.

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