

## Sources of Arsenic in the Environment

Some of you may be wondering, just like me, where does arsenic come from? Arsenic is released to the environment in a variety of natural and anthropogenic ways. Arsenic occurs in rocks, soil, water, and air and in biota. The average concentrations in the earth's crust range from 1.5 to 5 mg/kg. There are some higher concentrations found in some igneous and sedimentary rocks particularly in iron and manganese ores. Arsenic is also found in a variety of common minerals, the most important are arsenopyrite ( $\text{FeAsS}$ ), realgar ( $\text{AsS}$ ), and orpiment ( $\text{As}_2\text{S}_3$ ). The natural concentrations of arsenic in the soil range from 0.1 to 40 mg/kg with an average concentration of 5-6 mg/kg, through erosion, dissolution and weathering, arsenic can be released to ground water and surface water. Geothermal waters can be sources of arsenic in ground water, particularly in the western United States. Volcanism and forest fires can also be another natural sources of arsenic.

Anthropogenic sources of arsenic relates to its use in the lumber, agriculture, livestock and general industries. Most of the agricultural uses of arsenic have been banned in the U.S. However, organic arsenic is a constituent of the organic herbicides monosodium methanersonate (MSMA) and disodium methanersonate (DSMA), which are currently applied to cotton fields as herbicides. Organic arsenic is also a constituent of feed additives for poultry and swine and appears to concentrate in the resultant animal wastes. The potential impact of arsenic in animal wastes used for fertilizing crops is uncertain at this time.

Most of the arsenic used in the U.S. is for the production of chromate copper arsenate, in the wood preservation. The industrial use of arsenic is used in production of lead-acid batteries and very pure arsenic metal used to produce the semiconductor crystalline gallium arsenide, which is used in computers and electronic applications.

Research information from the web page of EPA.