



About the book and congress series “Arsenic in the Environment”

Although arsenic has been known as the ‘silent toxin’ since ancient times, and the hazard of arsenic of geogenic origin in drinking water resources was described from different places around the world long ago—e.g. in Argentina in 1917— it is only in the last two decades, that it has received overwhelming public attention worldwide. As a consequence of the biggest arsenic calamity in the world detected more than two decades ago in Southern Asia, there has been an exponential rise in scientific interest that has triggered high quality research. Since then arsenic hazard in drinking water resources, soils, plants and air of predominantly geogenic origin, the propagation of arsenic in the food chain, the chronic affects of arsenic ingestion by humans, and their toxicological and related public health consequences, have been described in many parts of the world, and every year there new countries or regions where the arsenic hazard is newly discovered. These discoveries together with the recent lowering of the regulatory limits for arsenic concentration in drinking water to 10 µg/l, means that number of people known to be exposed to drinking water concentrations of arsenic higher than the regulatory limit are increasing, and the estimate of 200 million people exposed worldwide to arsenic through drinking water alone, may now be an underestimate.

The book series “Arsenic in the Environment” (Balkema/CRC Press/Francis & Taylor), is an inter- and multidisciplinary source of information, making an effort to link the occurrence of geogenic arsenic in different environments and media including ground- and surface water, soil and air, and its effect on human society. The series fulfills the growing interest on the arsenic issue worldwide which is being accompanied by stronger regulations on arsenic contents in drinking water and food, which were and are adapted not only by the industrialized countries, but increasingly by developing countries.

The book series covers all fields of research concerning arsenic in the environment with an aim to present an integrated approach from its occurrence in rocks and their mobilization into the ground- and surface water, soil and air, its transport therein, the pathways of arsenic and their introduction into the food chain up to the uptake by humans. Human arsenic exposure, bioavailability, metabolism and toxicology are treated together with related public health effects and risk assessments in order to better manage the arsenic-bearing terrestrial and aquatic environments to reduce human arsenic exposure. Arsenic removal technologies and other methodologies to mitigate the arsenic problem are addressed not only from the technological, but also from economic and social, point of view considering legislative and political issues and international cooperation, as e.g. international agreements or programs for mitigating the arsenic problem. Only such inter- and multidisciplinary approaches, would allow case-specific selection of optimal mitigation measures of to provide arsenic safe drinking water, food, and air.

We have an ambition to make this book series an international, multi- and interdisciplinary source of knowledge and a platform for arsenic research oriented to the direct solution of problems with considerable social impact and relevance rather than only focusing on cutting edge and breakthrough research in physical, chemical, toxicological, medical and other specific issues on arsenic on a broader environmental realm. The book series shall also form a consolidated source with information on worldwide occurrences of arsenic, which otherwise is dispersed and often hard to access, is bundled, and therefore anybody can easily find and access information about arsenic related topics. It shall also have a role to increase awareness and knowledge among administrators, policy makers and company executives, on the problem and to improve the international and bilateral cooperation on geogenic arsenic hazard and its effects globally.

As consequence we see this book series as comprehensive information base, which includes authored or edited books from world-leading scientists on their specific field of arsenic research, but will also contain volumes with selected papers from international or regional congresses or other scientific events. Further on, the abstract books of the homonymous international congress series, which we organize biannually in different parts of the world shall appear in this book series. The series shall be open for anybody, in person or as scientific associations, society and scientific networks, for bringing in new book projects. Supported by a strong multi-disciplinary editorial board, book proposals and manuscripts will be peer reviewed and evaluated. The first volume with the title “Geogenic Arsenic in Groundwater of Latin America” is publishes in 2008, one of the following up volumes has the title is “Arsenic in Taiwan—past and present”.

Jochen Bundschuh
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(congress series organizers
and editors of book series)

Arsenic Characteristics. • Most natural waters contain inorganic species. • As (III) or arsenite predominant in ground waters H_3AsO_3 . • As (V) or arsenate in surface waters H_2AsO_4 & $HAsO_4^{2-}$. Natural Arsenic Levels. Crystalline Rock. Ground Water. 0.01 – 800 ppb. As high as 40,000 in hot springs. Surface Water. 2.38 – 65 ppb. As high as 22,000 in river water. Some Arsenic Uses/Anthropogenic Sources. • Smelting of metals • Pharmaceutical industry (medicines) • Pesticide manufacture (very limited) • Wood preservative • CCA [in phase out] • Cattle and sheep dips • Feed additives • Dye stuffs • Petroleum, coal, and wood burning • Semiconductor manufacture • Waste incineration. Toxicokinetics. Toxicokinetics. However, arsenic in the environment is not immediately dangerous, and it is rare to find toxic amounts of arsenic in nature. Fast facts about arsenic poisoning. Arsenic is a natural metalloid chemical that may be present in groundwater. Ingestion only poses health problems if a dangerous amount of arsenic enters the body. Then, it can lead to cancer, liver disease, coma, and death. Treatment involves bowel irrigation, medication, and chelation therapy. Anyone who suspects there may be high arsenic levels in their local environment should contact their local authorities for more information. What is arsenic? Share on Pinterest. The effects of arsenic are dangerous, but overexposure to it is very rare. Arsenic is a naturally occurring, metalloid component of the Earth's crust.

Though arsenic occurs naturally in rocks and soil, the majority of arsenic released into the environment is from industrial smelting, produced as byproduct of smelting for copper, lead and zinc. The last US smelter producing arsenic closed in 1985 in Tacoma, Washington. Smelters typically released the trivalent arsenic trioxide and lead into the atmosphere, which contaminated local environments and left an unhealthful legacy for local residents. Inorganic arsenic is also released from coal-fired electric generation facilities. Since US production ceased in 1985, all arsenic consumed in the US. Arsenic levels in the environment have become a global concern due to its toxicity and adverse effects on human health; even at low concentrations, it is highly toxic and classified as a carcinogen. Although it often exists in soils and plants from natural sources such as igneous and sedimentary rocks, the largest anthropogenic source of arsenic is the use of chromated copper arsenate (CCA)-treated wood. As the wood comes in contact with both soil and water, arsenic can be released into the environment. Atmospheric releases of arsenic may also occur when mining, smelting and refining, industri Previous (Arsacid Dynasty of Armenia). Next (Arson). Arsenic (chemical symbol As, atomic number 33) is a notoriously poisonous metalloid. It comes in many allotropic forms, of which the yellow, black, and gray forms are regularly seen. It is sometimes found in its elemental form in nature, but it is usually combined with metals in various minerals. Given its high toxicity and the ease with which it could be used surreptitiously, arsenic was used in history by murderers, including members of the ruling