



Anoxic changes of arsenic solubility in arsenic rich soils, bottom sediments and mine wastes.

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Solubility of arsenic in soils and waste material depends on various factors, including redox conditions. As the mechanisms governing those changes are complex, it is not easy to predict in which direction they proceed. In the areas, where soils are strongly polluted with arsenic, its increased mobility may cause enhanced environmental hazards and risk of water pollution. Our study was carried out in two areas where arsenic ores were mined and processed over the centuries: in the vicinity of a hill Zeleznik and in Zloty Stok, former gold mining centre (Lower Silesia, Poland). Soil samples, bottom sediments and waste material collected in those areas contained up to 1.8 percent of As. Operationally defined chemical forms of As were determined in selected samples using sequential extraction by Wenzel et al., which showed that the main forms of As were those occluded in amorphous and crystalline iron oxides, and therefore, arsenic mobilization from solid material, in particular from soils, was considered as possible in deeply reducing conditions of the environment. Arsenic solubility in soils and wastes was determined in the incubation tests within the periods of 3, 7, 14 and 28 days. Arsenic concentrations in solution tended to increase initially, and then decreased, probably as a result of chemical and biological sorption. We did not observe intensive mobilization of arsenic even from strongly polluted soils. Further tests are presently carried out after sample sterilization, to exclude microbial processes.