PO 3.24

Investigation of diffusive gradients in thin films technique applicability for mercury speciation measurements

Pavel Diviš[1], Lukáš Brulík[1] and Hana Dočekalová[1]

[1]Brno University of Technology, Faculty of Chemistry, Purkyňova 118
612 00 Brno, The Czech Republic, divis@fch.vutbr.cz

The environmental mobility and toxicological effects of mercury are strongly dependent on the chemical species present. Free metal ion and labile inorganic complexes play an essential role in the methylation of Hg since they are the Hg species available for methylation. Because concentrations of mercury in water samples are very low, accurate analysis is still major problem. Other problems are associated with collection and handling of samples. It is well known that chemical forms of metals in sample can change because of preservation and storage of sample. All these problems can be overcomes by application of in situ techniques. Recently a new technique for in situ sampling solutes known as the diffusive gradients in thin films technique (DGT) has been developed. In our laboratory we have modified this technique for measuring of mercury in natural waters and we have investigated its applicability for mercury speciation measurements. The DGT technique measures only those metal species that are able to pass through the diffusive gel and that are likely to be captured by resin immobilized in thin film gel. Use of different resins with different capture efficiencies enable to estimate fractions of mercury bonded in different complexes. In presented work we summarized the results from DGT mercury measurements in river water and in fresh and saline sediment pore waters. The resins used during the work were Chelex-100 with iminodiacetic acid functional groups and Spheron Thiol with Duolite GT73 containing thiol functional groups bonded on different matrix.