



Photochemistry of Mercury and Organics in Sea Ice – Laboratory Investigations

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Sea-Ice may trap toxic pollutants such as mercury from the atmosphere and foster their discharge to the aquatic environment during melting periods. Once released to the ocean, the toxics can enter the food web. Here we present experiments on the chemical reactivity of mercury in the ice matrix that result in a re-emission of mercury to the atmosphere. Better knowledge of this process might help to improve global budgets of mercury.

We describe a set of laboratory experiments where we quantified the light-driven mercury reduction in ice and its subsequent release from the ice matrix. The experiments focused on the effect of organic matter, such as benzophenone, oxalic acid, and humic acid on the reaction kinetics. The influence of halogen ions, pH and temperature was also investigated.

This – to our knowledge- first description of the light-driven mercury reduction in ice showed that organic matter significantly enhances the reactivity. Reaction pathways are proposed to explain the observation. The results also indicate that the photolysis rate is significantly reduced in the presence of halogens at typical concentrations of sea water.