

Kinetic Controls on the Formation of Complexes Between Mercury and DOM in a Contaminated Environment

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The interaction of Hg with dissolved organic matter (DOM) under equilibrium conditions has been the focus of many studies but the kinetic controls on this interaction has often been overlooked. This study examined the rate of Hg-DOM complexation through reactive Hg (HgR) measurements to differentiate inorganic and DOM complexed Hg in the Upper East Fork Poplar Creek (UEFPC) in Oak Ridge, TN. Results indicate that >90% of the dissolved Hg was present as HgR at the headwaters of the creek but a decrease in HgR was observed downstream (>25% of dissolved Hg at all sites examined). The presence of HgR throughout the creek suggests complexes other than Hg-DOM are present and equilibrium complexation has not established. The formation rate of Hg-DOM complexes was further examined in the laboratory using a DOM isolate and similarity between the rates measured in creek water and in DOM solutions suggests that the formation rate of the Hg-DOM complexes is important in controlling the complexation of Hg in UEFPC.