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**Possible Exchange Reactions during Analysis of Gaseous Oxidized Mercury** NA MAO, Department of Chemistry and Environmental Science, New Jersey Institute of Technology, DUYEN NGUYEN, Department of Chemical Engineering, New Jersey Institute of Technology, ALEXEI KHALIZOV, Department of Chemistry and Environmental Science, New Jersey Institute of Technology — Gaseous oxidized mercury (GOM) is formed in the atmosphere upon photochemical oxidation of gaseous elemental mercury. Due to low atmospheric concentration of GOM, its chemical analysis requires pre-concentration on various substrates, such as KCl or various membranes. We hypothesize that GOM species collected on those substrates can engage in exchange reactions with the substrate, each other, or with other co-adsorbed atmospheric chemicals, changing the chemical composition of GOM and potentially leading to analysis artifacts. Here we investigated the exchange reactions of several GOM surrogates ( $\text{HgCl}_2$ ,  $\text{HgBr}_2$ ,  $\text{HgI}_2$ ) in aqueous solutions and on surfaces. Exchange reaction products were analyzed using ion drift - chemical ionization mass spectrometry (ID-CIMS) and electrospray ionization - mass spectrometry (ESI-MS). We observed volatile  $\text{HgBrCl}$ ,  $\text{HgBrI}$ ,  $\text{HgClI}$  as a result of exchange in aqueous solutions. Our preliminary results also indicate that the exchange reactions can occur on surfaces, producing products that are not related to original GOM, but can be volatilized by thermal evaporation.

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