Biogeochemistry of reactive halogens and the omnipresence of iodine

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Emissions of very short lived halogenated species (VSLS) halogenated compounds with atmospheric lifetimes of less than 6 months - lead to ozone loss in the marine and polar troposphere and in the lower stratosphere, and are calculated to contribute a negative radiative flux at the tropical tropopause. In the marine tropical free troposphere, IO concentrations remain elevated above the ocean surface, and together with reactive bromine may contribute several tens of percent to total ozone loss over much of the troposphere. The atmospheric chemistry of these compounds may also have impacts on nitrogen oxide speciation and abundance in the troposphere, as well as on nucleation of new particles in the marine atmosphere. Recently, iodine has been detected in growing aerosol particles in the Arctic over the Greenland Sea indicating that it has significant impacts over most of the globe. Laboratory data suggests that, over much of the ocean, very short-lived inorganic precursors dominate marine iodine emissions however in polar regions, sources of reactive iodine are a subject of debate. This presentation discusses whether such observations can be reconciled with current understanding of reactive halogen sources and chemistry.