

Catching quicksilver – The chemical and phase speciation of atmospheric oxidized mercury

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A global concern because of its potential for long range transport and toxicity, atmospheric mercury is loosely defined as gaseous elemental mercury (GEM), reactive gaseous Hg²⁺ mercury species (RGM) and particulate mercury (Hg^p) with the chemical speciation of RGM long recognized as unknown. But what chemical species does RGM actually consist of?

Typically, RGM is collected on a KCl denuder, decomposed to GEM for cold vapor atomic fluorescence spectroscopy analysis whereby chemical speciation is lost. Direct chemical speciation is possible using mass spectrometry. In a novel technique, RGM species are trapped on packed sorbent traps before thermal desorption into an APCI-MS for detection. Urban air in Montreal sampled suggest the detection of HgBr₂ and HgCl₂ using mercury mass spectrometry. [1]

Using a variety of techniques, in addition to mercury mass spectrometry, including condensation particle counters, electron microscopy, nanoparticle tracking analysis and cold vapour atomic fluorescence spectroscopy, the speciation and phase of mercury species can be explored.

[1] Deeds, Ghoshdastidar, Raofie, Guerette, Tessier and Ariya (2015) *Journal of Analytical Chemistry* **Just Accepted Manuscript** DOI: 10.1021/ac504545w