

Characterisation of the deposition of organolead compounds in the Irish peatlands by GC-MC-ICP-MS

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From the Industrial Revolution to the present, smelting and refining of metal-bearing ores in Ireland has released lead-containing particles into the atmosphere. Due to their unique characteristics, ombrotrophic (rain-fed) peat bogs offer exceptional opportunities to study the long term atmospheric deposition of metals from various sources.

Pb isotope analysis of peat subsamples from the Liffey peat bog in the Wicklow Mountains, Ireland, has revealed mixing trends between Pb enriched sources with different signatures¹. Some of those sources are undoubtedly organolead compounds, added to fuels since the 1930's; the organolead compounds released by burnt fuels have been detected within Greenland ice cores².

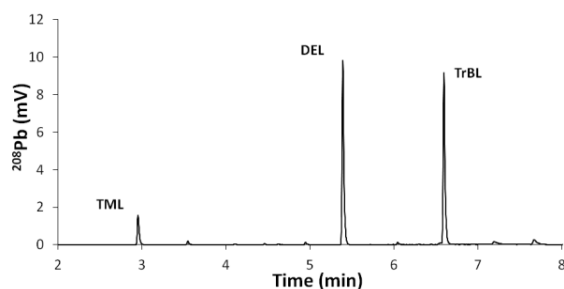


Figure 1: Separation of trimethyllead (TML), diethylead (DEL) and tetrabutyllead (TrBL) by GC-MC-ICP-MS.

The coupling of gas chromatography (GC) to multicollector inductively coupled plasma mass spectrometry (MC-ICP-MS) allows isotopic signatures of the organolead compounds to be determined separately from the inorganic lead. Here we report on Pb isotope analysis of three organolead compounds (Figure 1) extracted from the Liffey peat subsamples by GC-MC-ICP-MS, using the new, commercially available, Thermo Scientific™ GCI-300 interface coupled to the Neptune Plus™ MC-ICP-MS.

[1] Rosca (2016) *59th Irish Geological Research Meeting, Galway, Ireland* [2] Hong (1994) *Science*, **265**, 1841-1843