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$\delta^{13}\text{C}$ OF VOLATILE ORGANIC COMPOUNDS (VOC'S) IN AIR SAMPLES BY THERMAL DESORPTION GC-IR-MS

Nicole Turner¹, Kliti Grice¹, Marisa Ioppolo-Armanios², Mark Jones², Daniel Dawson¹

¹Stable isotope and Biogeochemistry Group, Centre for Applied Organic Geochemistry, Kent Street, Bentley, Curtin University of Technology.

²Alcoa World Alumina, Australia. Technology Delivery Group. PO Box 161, Kwinana WA 6167.

A novel Thermal Desorption-Gas Chromatography-isotope ratio– Mass Spectrometry (TD-GC-ir-MS) method was developed to determine the $\delta^{13}\text{C}$ values of VOC's in airbourne samples. During the method development, the following factors were tested- i) adsorbent resin choice, ii) tube conditioning time, iii) thermal desorption time, iv) reproducibility of the TD-GC-MS method and v) linearity of the TD-GC-MS method. Tenax TA was chosen as a suitable adsorbent resin, tubes were conditioned for 4 hours, a thermal desorption time of 5 minutes was chosen and the TD-GC-MS method employed was proven to be both reproducible and linear.

$\delta^{13}\text{C}$ values of various standards were found to be consistent, within the error of analysis from both direct GC-ir-MS and TD-GC-ir-MS performed on an IsoPrime isotope ratio mass spectrometer. It was proven that the novel TD-GC-ir-MS procedure developed caused negligible isotopic fractionation for benzene, toluene, chlorobenzene, ethylbenzene, *m*-xylene and propylbenzene and is therefore a viable method for $\delta^{13}\text{C}$ analysis of VOC's in airbourne samples.