

Interaction of volatile organic compounds with airborne particulate matter.

Walgraeve Christophe, Demeestere Kristof, Van Langenhove, Herman

Research Group EnVOC, Department of Sustainable Organic Chemistry and Technology, Faculty of Bio-science Engineering, Coupure Links 653, 9000 Ghent, Belgium

Christophe.Walgraeve@UGent.be

Selected Ion Flow Tube Mass Spectrometry or SIFT-MS is a relatively new analytical technique for the real-time measurement of trace-gases and Volatile Organic Compounds (VOCs) concentrations. With this technique, target molecules are ionized by chemical ionization using H_3O^+ , NO^+ and O_2^+ precursor ions, produced by a microwave discharge source. Product ions and unreacted precursor ions are formed and are analyzed by a downstream quadrupole mass filter. Concentrations of the target compounds can be calculated using the reaction rate constants, and detection limits in the order of 1 ppb can be obtained. The SIFT-MS real-time measurement offers unique and new opportunities to characterize materials and to study the interaction of VOCs with materials. In this study, SIFT-MS (Voice 200) was used to characterize airborne particulate matter samples by investigating the interaction of a selected set of volatile organic compounds (having different physical chemical properties) with airborne particulate matter. This was accomplished by the measurement of breakthrough curves. Therefore, a step function of the target VOCs was applied to a column packed with airborne particulate matter and the response was registered by means of SIFT-MS.