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Atmospheric Measurement Techniques Discussions

Interactive comment on "Real-time monitoring of trace-level VOCs by an ultrasensitive compact lamp-based VUV photoionization mass spectrometer" *by* W. Q. Sun et al.

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1) The ppb-level benzene samples were produced by triple dilutions. The concentration of benzene in the 6.35 L bottle was 1000 ppmv. For the experiments of the parameter optimization, the 10 ppbv benzene sample was prepared by adding 1.2 mL of 1000 ppmv benzene into a 120 L chamber with a syringe. For the calibration experiments, an initial 400 ppb benzene sample was prepared by injecting 0.1 mL of 1000 ppmv benzene into a 0.24 L cylinder. Then, synthetic air with a flow rate of 0.2 L min-1 was continuously injected into the cylinder to dilute the 400 ppb benzene sample. The ppbv-level and sub-ppbv benzene samples were obtained by the exponential dilution

method reported by Lovelock (1961).

2) The aromatic species do have higher photoionization efficiencies. Compared with aromatic species, other VOC species generally have lower photoionization efficiencies. In the experiment, we found that the sensitivity of the instrument to isoprene was only one third of that to benzene. Since LOD of the instrument to benzene is 3 pptv, the VOCs with concentrations more than 50 pptv are supposed to be detected. The partially enlarged plot in Figure 1 shows that the signals from non- aromatic VOCs were obtained.

3) The "an" before "instrument" has been deleted.

4) The sentence "the highest repetition rates are obtained for the best LODs" was changed to "the high repetition rate of 35000 s-1 is obtained for better LODs".

5) Each mass spectrum was obtained by accumulating 350000 times of ion extractions, which is equal to 10 s acquisition with the repetition rate of 35000 s-1.

6) R^2=0.9968 is changed to R^2=0.997.

References:

Lovelock, J. E.: Ionization methods for analysis of gases and vapors, Anal. Chem., 33, 162-178, 1961.

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 5877, 2015.

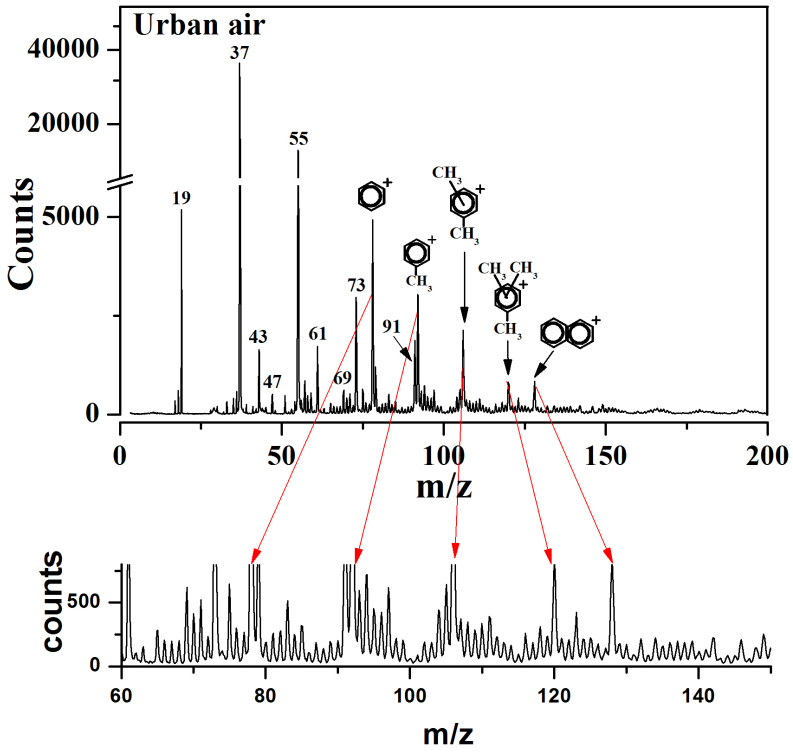

Fig. 1. low concentration VOCs in outdoor air