Atmos. Meas. Tech. Discuss., 8, C1931–C1933, 2015
www.atmos-meas-tech-discuss.net/8/C1931/2015/

Atmospheric Measurement Techniques Discussions

Interactive comment on "Intercomparison of the comparative reactivity method (CRM) and pump-probe technique for measuring total OH reactivity in an urban environment" *by* R. F. Hansen et al.

Anonymous Referee #1

Received and published: 10 July 2015

This paper demonstrated intercomparison of total OH reactivity measurement by 2 instruments based on different method at urban site. There are detailed explanation about the test of these instruments. Also authors pointed out several problems. These detailed explanations are quite helpful to understand and improve these instruments.

CRM needs 3 major corrections. Especially, the influence of humidity and NO are quite large (Fig. S11). But surprisingly, final comparison result (Fig. 7) shows good linear relationship between 2 methods. But there is uncertainty with absolute value of total

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

OH reactivity. When filed measurement is done only by CRM, I hesitate to trust the absolute value of the total OH reactivity. You need to be very careful if the correction factors do not change during calibration (in laboratory) and during filed measurement. Although there are several problems with these methods, this paper will contribute to improve these problems. Therefore I recommend this paper for publication with minor revision.

detailed comments:

line385-387 : NO from NO2 (46%) would be significant influence to the results, even in clean ambient air condition (low NO but some NO2). If NO2 convert to NO on surface, does this conversion factor depend on relative humidity (or water content) of the air? The condition of the surface will be influenced by water concentration. Also, does the conversion factor depend on NO2 concentration?

line 629- : Are there O3 scrubbers before trapping the ambient air sample?

line667-, 927- Fig.8 : It is regret that CO concentration is not available and is assumed to be constant. The contribution of CO seems to be 10- 25 % (Fig. 8) of the total OH reactivity and CO concentration change will be not negligible. Usually CO and anthropogenic VOCs will change similarly. If some of CO and VOCs are available near this observation site, CO concentration change can be estimated by VOC concentration change.

line847-857 : Underestimate of CRM in Fig.S8 is 45%. In ambient air measurement, is it possible to assume that concentration of VOCs which absorb UV is similar proportion of the VOC standard gas?

line 855 : Fig.5 -> Fig. 6

Fig. 8 : CRM is larger than FAGE in most time. This is not consistent with Fig. 7. Is this mistake of making figure legend? Or did CRM show higher value during the week (relatively clean condition) ?

AMTD
8, C1931–C1933, 2015

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 6119, 2015.

AMTD

8, C1931–C1933, 2015