

Report of calibration work

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Serial Number of
Instrument: 0934138938

Results: **SO₂_43i ppbV = 0.8205 York Primary
Standard ppbV + 2.0157 ppbV**

Uncertainty at amount fractions between 0 and
100 ppbV < 1ppbV

Carried out and
authorised by: Dr Katie Read
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Signed:



Reference to NPL Scale

The SO₂ standards are supplied by BOC and verified by the National Physics laboratory (NPL). The reference standard (Cylinder number 176433) was purchased on 10/10/2016 and is certified for 5 years.

Measurement procedure

The sample line used for the visiting instrument had previously been conditioned at an amount fraction of 1000 nmol/mol of SO₂ for over an hour.

The blender set-up varied the outputs over a range of 0-100ppbV with the zero achieved both from the Pure Air generator (PAG003) and additionally using a charcoal trap.

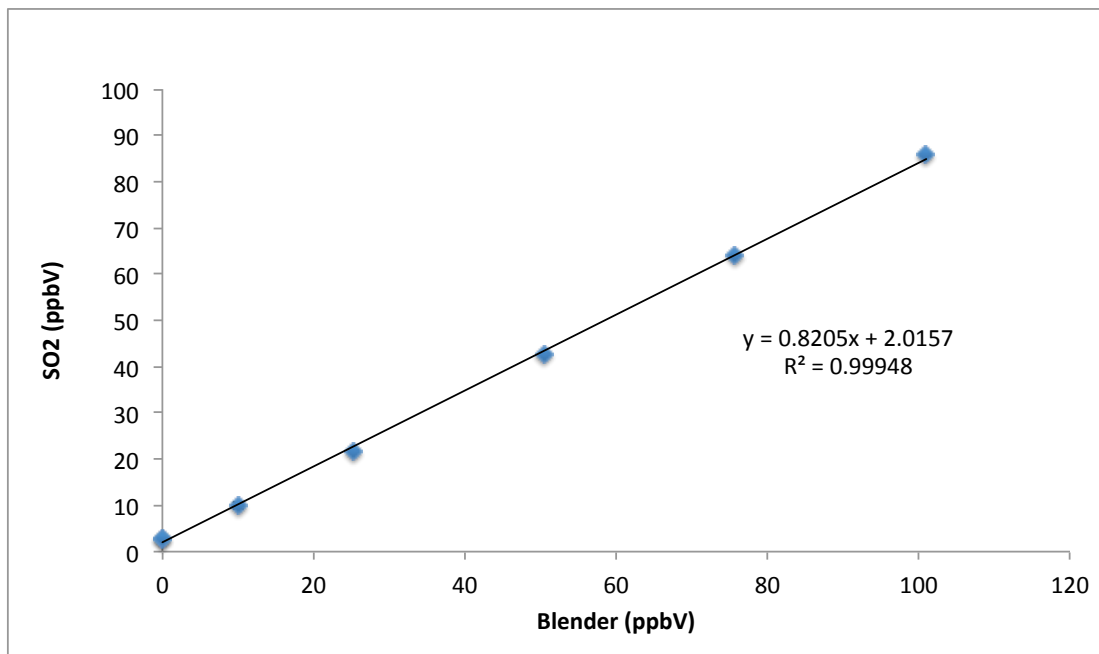
SO₂_43I output in ppbV = **m** Blender (corrected according to Primary Standard) ppbV + **c**

where: **m** is the gradient determined as the ratio of the visiting instrument reading for SO₂ to the blender reading for ozone and **c** is the zero intercept expressed in ppbV.

Results

Blender set point (ppbV)	Blender (corrected) ppbV	Measured SO ₂ (ppbV)	Standard deviation (ppbV)
50	50.5	42.71	0.24•
75	75.75	64.02	0.16•
25	25.25	21.72	0.23•
100	101	85.66	0.15•
10	10.1	10.02	0.74•
0 (PAG)	0	2.72	0.17•
0 (Charcoal)	0	2.75	0.06•

•These are the last 5 minutes of 15-minute samples at each level. Noise would be reduced if more time were allowed for stability.



$\text{SO}_2_{43i} \text{ ppbV} = 0.8205 \text{ York Primary Standard ppbV} + 2.0157$
ppbV

The above equation is only valid in the amount fraction range 0-100 ppbV.

We recommend that you carry out calibrations at least annually to verify the stability of your analyser.

Other notes

This instrument was originally brought to the COZI-lab in December prior to a field campaign in Nicaragua. The instrument was found to read 10% under at this time. Assistance was provided with respect to running the instrument (logging, water removal, and zeroing procedure) and a charcoal trap and nafion were provided on loan. The linear calibration described here was performed on the instruments return to the UK in January. Due to the instrument suffering some physical damage whilst it was away, the earlier December calibration may in fact not be valid.

This work was carried out in the COZI-Lab in the Wolfson Atmospheric Chemistry laboratories (WACL) at the University of York. The COZI-Lab is principally funded through the National Centre for Atmospheric Science (NCAS).