

OZONE ANALYZER INTERCOMPARISON
 Thermo 49c 0427508923

intercomparison place : Bologna
 intercomparison operator: Francescopiero Calzolari
 Transfer Standard: Thermo 49iPs s/n: 1404860524
 Transfer Standard has been evaluated by ENPA on 1900-01-01 with SRP#15 giving
 slope of 1.000 and intercept of -0.3
 TS has been warmed-up for more then 12 hours and OA has been conditioning at
 200ppb for more then 2 hour
 OA has been evaluated at the following 9 concentration levels: 0, 15, 25, 50,
 75, 80, 100, 125 e 150 ppb

OA and TS condition:
 OA 0427508923 BKG=-0.2 ; Coeff=1.010
 TS 1404860524 BKG=-0.3 ; Coeff=1.000
 intercomparison start : 2024-06-18 16:19 ; intercomparison end : 2024-06-18
 23:16
 LinregressResult(slope=1.0043202527171589, intercept=-0.014197055503771594,
 rvalue=0.9999963895035472, pvalue=9.900147213325766e-48,
 stderr=0.0006361149510360183, intercept_stderr=0.05415010107192961)

Linear regression results OAm_{ean} = TS_{mean}*slope + intercept:
 TS Transfer Standard
 OA 03 Analyzer

slope = 1.004320 slope_stderr = 6.361e-04
 intercept = -0.014197 intercept_stderr = 5.415e-02
 rsquare = 0.999993 covariance = -6.334e-22

TS_{mean}: TS average [O3] for each calibration step
 OA_{mean}: OA average [O3] for each calibration step
 Predicted = OA_{mean}*slope + intercept
 TS_{std}: TS standard deviation [O3] for each calibration step
 OA_{std}: OA standard deviation [O3] for each calibration step
 Residual = TS - predicted
 Deviation = OA - TS

TS _{mean}	TS _{std}	OA _{mean}	OA _{std}	predicted	residual	deviation
74.685	0.089	74.170	0.168	74.476	0.208	-0.515
149.674	0.067	148.820	0.133	149.449	0.225	-0.854
124.686	0.149	124.080	0.108	124.602	0.084	-0.606
24.719	0.081	24.500	0.173	24.592	0.127	-0.219
99.711	0.092	99.130	0.135	99.544	0.167	-0.581
79.732	0.129	79.280	0.236	79.608	0.124	-0.452
49.671	0.115	49.480	0.117	49.680	-0.008	-0.191
14.693	0.078	14.650	0.102	14.699	-0.006	-0.043
99.714	0.065	99.330	0.135	99.745	-0.031	-0.384
149.721	0.112	149.280	0.214	149.911	-0.190	-0.441
0.073	0.143	0.040	0.080	0.026	0.047	-0.033
49.680	0.087	49.580	0.125	49.780	-0.100	-0.100
24.725	0.071	24.690	0.114	24.782	-0.057	-0.035
99.684	0.085	99.300	0.141	99.715	-0.031	-0.384
124.696	0.089	124.260	0.080	124.783	-0.087	-0.436
14.738	0.097	14.710	0.151	14.759	-0.022	-0.028
74.709	0.082	74.430	0.210	74.737	-0.028	-0.279
99.695	0.212	99.560	0.284	99.976	-0.280	-0.135
79.759	0.094	79.510	0.130	79.839	-0.081	-0.249
0.035	0.104	0.110	0.070	0.096	-0.062	0.075

Unoise: OA_{std} average = 0.145
 Ulinearity: Residual standard deviation = 0.128
 Urepeat = sqrt(Unoise² + Ulinearity²) = 0.194
 Udrift = sqrt(0.58²+(0.0025*C)²) = 0.632

$$U = \sqrt{U_{\text{repeat}}^2 + U_{\text{drift}}^2} = 0.661$$

$$C = 100.0$$

compensation equation to obtain unbiased concentration

$$[O_3]_{\text{unbiased}} = ([O_3] * 1.004) - 0.014$$

Intercomparison 49c s/n 0427508923 date : 20240618

