

OZONE ANALYZER INTERCOMPARISON
Thermo 49c 04275089232

intercomparison place : Lab 103 ISAc Bologna
intercomparison operator: Maurizio Busetto, Paolo Cristofanelli
Transfer Standard: Thermo 49iPs s/n: CM21267121
Transfer Standard has been evaluated by NaN on NaN with SRP#15 giving slope of NaN and intercept of NaN
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 5 concentration levels: 0, 25, 50, 75, 100 e 125 ppb

OA and TS condition:
OA 04275089232 BKG=-0.2 ; Coeff=1.010
TS CM21267121 BKG=-0.0 ; Coeff=1.017
intercomparison start : 2023-06-15 07:19:00 ; intercomparison end : 2023-06-15 14:27:00
LinregressResult(slope=1.016281872132176, intercept=-0.055143825056418905, rvalue=0.9999981438200006, pvalue=1.325426343714234e-47, stderr=0.0004749144294584987, intercept_stderr=0.024885496896433105)

risultati regressione lineare $OA_{mean} = TS_{mean} * slope + intercept$:
TS Transfer Standard
OA O3 Analyzer

slope	= 1.016282	slope_stderr	= 4.749e-04
intercept	= -0.055144	intercept_stderr	= 2.489e-02
rsquare	= 0.999996	covariance	= -8.776e-22

TSmean : media [O3] TS ogni step di calibrazione
OAmean : media [O3] OA per ogni step di calibrazione. NB: OAmean \hat{A} ottenuta dalle misure dell'analizzatore riportate a slope=1.0 e bkg=0.0
Predicted = TSmean*slope + intercept
TSstd : standard deviation [O3] TS per ogni step di calibrazione
OAstd : standard deviation [O3] OA per ogni step di calibrazione
Residual = TS - predicted
Deviation = OA - TS

TSmean	TSstd	OAmean	OAstd	predicted	residual	deviation
0.042	0.179	-0.044	0.070	-0.100	0.142	-0.087
14.999	0.151	14.923	0.189	15.111	-0.112	-0.076
50.001	0.097	49.305	0.202	50.053	-0.052	-0.696
24.990	0.199	24.673	0.197	25.020	-0.030	-0.317
74.997	0.116	73.871	0.149	75.019	-0.022	-1.126
99.976	0.140	98.444	0.196	99.992	-0.016	-1.532
-0.047	0.121	-0.046	0.087	-0.102	0.055	0.001
24.988	0.194	24.752	0.169	25.100	-0.112	-0.236
75.050	0.119	73.950	0.203	75.099	-0.049	-1.100
100.008	0.097	98.377	0.174	99.924	0.084	-1.631
14.979	0.074	14.707	0.121	14.891	0.088	-0.272
49.994	0.067	49.239	0.174	49.986	0.008	-0.755
-0.036	0.116	0.043	0.088	-0.011	-0.024	0.079
49.984	0.182	49.217	0.203	49.963	0.021	-0.767
99.995	0.121	98.372	0.231	99.919	0.076	-1.623
24.984	0.104	24.670	0.195	25.017	-0.033	-0.314
15.051	0.207	14.847	0.150	15.034	0.017	-0.204
49.974	0.094	49.298	0.154	50.046	-0.072	-0.676
-0.014	0.128	0.014	0.052	-0.041	0.027	0.028

Unoise : media OAstd	= 0.158
Ulinearity : standard deviation Residual	= 0.068
Urepeat = $\sqrt{\text{Unoise}^2 + \text{Ulinearity}^2}$	= 0.172
Udrift = $\sqrt{0.58^2 + (0.0025 * C)^2}$	= 0.632
U = $\sqrt{\text{Urepeat}^2 + \text{Udrift}^2}$	= 0.655
C	= 100.0

compensation equation to obtain unbiased concentration
 $[O3_{\text{unbiased}}] = ([O_A] * 1.016) - 0.055$

Intercomparison 49c s/n 04275089232 date : 20230615

