

# Soyuz 25 Return Samples: Assessment of Air Quality aboard the International Space Station



Six mini-grab sample containers (m-GSCs) were returned aboard Soyuz 25. The toxicological assessment of 6 m-GSCs from the ISS is shown in Table 1. The recoveries of the 3 internal standards, <sup>13</sup>C-acetone, fluorobenzene, and chlorobenzene, from the GSCs averaged 76, 108 and 88%, respectively. Formaldehyde badges were not returned aboard Soyuz 25.


Table 1. Analytical Summary of ISS Results

Module/ Sample	Date of Sample	NMVOCs <sup>a</sup> (mg/m <sup>3</sup> )	Freon 218 (mg/m <sup>3</sup> )	T Value <sup>b</sup> (units)	Alcohols (mg/m <sup>3</sup> )
Lab	4/13/11	8.2	32	0.26	7.4
JEM	4/13/11	8.9	17	0.30	7.9
SM	4/13/11	9.5	34	0.28	8.3
Columbus	5/4/11	7.5	44	0.30	6.1
SM	5/4/11	7.6	53	0.29	6.2
Lab	5/4/11	8.4	28	0.35	6.7
<i>Guideline</i>		25	<i>none</i>	1.00	<5

<sup>a</sup> Non-methane volatile organic hydrocarbons, excluding Freon 218

<sup>b</sup> Based on 180-d SMACs and calculated excluding CO<sub>2</sub>, formaldehyde, and siloxanes.

Except for the relatively high alcohol values, the air quality parameters are well within bounds for acceptable air quality. Ethanol was the primary cause of the high alcohol levels; however, we are not aware of a new source of this compound. These results validate the elevated ethanol measurements recorded by the Air Quality Monitor and noted in the April and May Environmental Bulletins. The alcohol guideline is intended to protect the water recovery system from risk of overloading. In the 6 air samples, carbon monoxide averaged 1.6 mg/m<sup>3</sup>, which is down slightly from previous data (enclosed tables). Overall the air quality was consistent between modules and the compound concentrations from this limited number of samples suggest that the air was acceptable for respiration.

  
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 Chief Toxicologist

## Enclosures

Table 1: Analytical concentrations of compounds found in the Soyuz 25 return m-GSCs

Table 2: T-values of the compounds in table 1

TABLE 1  
ANALYTICAL RESULTS OF  
SOYUZ 25S RETURN MINI-GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	CONCENTRATION (mg/m <sup>3</sup> )					
	AA05091 S/N 2055	AA05092 S/N 2054	AA05093 S/N 2053	AA05094 S/N 2063	AA05095 S/N 2040	AA05096 S/N 2065
	LAB 04/13/11 @ 15:32 GMT	JEM 04/13/11 @ 15:35 GMT	SM 04/13/11 @ 15:40 GMT	COL 05/04/11 @ 13:17 GMT	SM 05/04/11 @ 13:27 GMT	LAB 05/04/11 @ 13:33 GMT
<b>TARGET COMPOUNDS (TO-14/POLAR)+++</b>						
FREON12	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CHLOROMETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
FREON114	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
METHANOL	0.66	0.61	0.71	0.63	0.62	0.57
ACETALDEHYDE	0.14	0.21	0.16	0.15	0.14	0.20
VINYLCHLORIDE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
BROMOMETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ETHANOL *	<b>5.8</b>	<b>6.2</b>	<b>6.3</b>	<b>5.0</b>	<b>5.0</b>	<b>5.5</b>
CHLOROETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ACETONITRILE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
PROPENAL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ACETONE	0.19	0.27	0.27	0.22	0.21	0.26
PROPANAL	0.066	0.062	0.082	TRACE	TRACE	TRACE
ISOPROPANOL	0.60	0.61	0.87	0.17	0.17	0.21
FREON11	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
FURAN	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ACRYLONITRILE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
PENTANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-METHYL-2-PROPANOL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
METHYLACETATE	<0.050	<0.050	<0.050	0.11	0.12	0.13
1,1-DICHLOROETHENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
DICHLOROMETHANE	<0.050	TRACE	TRACE	TRACE	<0.050	TRACE
3-CHLOROPROPENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
FREON113	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-PROPANOL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,1-DICHLOROETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
BUTANAL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-BUTANONE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CIS-1,2-DICHLOROETHENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-METHYLFURAN	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ETHYLACETATE	0.056	0.084	0.096	0.25	0.25	0.29
HEXANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CHLOROFORM	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-BUTENAL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-DICHLOROETHANE	TRACE	TRACE	TRACE	TRACE	TRACE	TRACE
1,1,1-TRICHLOROETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-BUTANOL	0.10	0.13	0.16	0.12	0.12	0.16
BENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CARBONTETRACHLORIDE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-PENTANONE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-METHYLHEXANE	<0.050	<0.050	<0.050	TRACE	TRACE	TRACE
2,3-DIMETHYLPENTANE	<0.050	TRACE	TRACE	TRACE	TRACE	TRACE
PENTANAL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
3-METHYLHEXANE	TRACE	TRACE	TRACE	0.057	0.056	0.067
1,2-DICHLOROPROPANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,4-DIOXANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
TRICHLOROETHENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2,5-DIMETHYLFURAN	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
N-HEPTANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
4-METHYL2-PENTANONE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CIS-1,3-DICHLOROPROPENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-PENTENAL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
TRANS-1,3-DICHLOROPROPENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,1,2-TRICHLOROETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
TOLUENE	0.069	0.076	0.076	0.091	0.088	0.10
HEXANAL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
MESITYLOXIDE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-DIBROMOETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
BUTYLACETATE	<0.050	<0.050	TRACE	<0.050	<0.050	<0.050
OCTANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
TETRACHLOROETHENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CHLOROBENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ETHYLBENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
M/P-XYLENES	<0.050	<0.050	<0.050	TRACE	TRACE	TRACE
2-HEPTANONE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CYCLOHEXANONE	<0.050	TRACE	TRACE	<0.050	<0.050	TRACE
HEPTANAL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
STYRENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,1,2,2-TETRACHLOROETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
O-XYLENE	0.066	0.087	0.11	0.14	0.15	0.14
NONANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,3,5-TRIMETHYLBENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2,4-TRIMETHYLBENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,3-DICHLOROBENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,4-DICHLOROBENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2-DICHLOROBENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1,2,4-TRICHLOROBENZENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
HEXACHLORO-1,3-BUTADIENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050

**TABLE 1**  
**ANALYTICAL RESULTS OF**  
**SOYUZ 25S RETURN MINI-GRAB SAMPLE CONTAINER AIR SAMPLES**

CHEMICAL CONTAMINANT	CONCENTRATION (mg/m3)					
	AA05091 S/N 2055 LAB 04/13/11 @ 15:32 GMT	AA05092 S/N 2054 JEM 04/13/11 @ 15:35 GMT	AA05093 S/N 2053 SM 04/13/11 @ 15:40 GMT	AA05094 S/N 2063 COL 05/04/11 @ 13:17 GMT	AA05095 S/N 2040 SM 05/04/11 @ 13:27 GMT	AA05096 S/N 2065 LAB 05/04/11 @ 13:33 GMT

TARGET COMPOUNDS (TOXIC)+++						
1,3-BUTADIENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
ETHYLENE OXIDE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CARBON DISULFIDE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-METHYL-2-PROPENAL	<0.050	<0.050	<0.050	<0.050	<0.050	TRACE
3-BUTEN-2-ONE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-ETHOXYETHANOL	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
DIMETHYLDISULFIDE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
OCTAMETHYLCYCLOTETRAILOXANE	##	##	##	##	##	##

NON-TARGET COMPOUNDS+++						
OCTAFLUOROPROPANE++	32	17	34	44	53	28
SULFURHEXAFLUORIDE	0.11	TRACE	0.095	0.085	0.13	0.13
PROPENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CHLORODIFLUOROMETHANE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CARBONYLSULFIDE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
1-BUTENE	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
2-METHYL-1,3-BUTADIENE(ISOPRENE)	0.062	0.072	0.071	0.078	0.073	0.096
TRIMETHYLSILANOL	0.20	0.25	0.22	0.23	0.22	0.29
HEXAMETHYLCYCLOTETRAILOXANE	##	##	##	##	##	##
LIMONENE	TRACE	0.068	0.10	0.082	0.085	0.074
DECAMETHYLCYCLOPENTASILOXANE	##	##	##	##	##	##

<b>TOTAL ALCOHOLS PLUS ACETONE</b>	<b>7.4</b>	<b>7.9</b>	<b>8.3</b>	<b>6.1</b>	<b>6.2</b>	<b>6.7</b>
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TARGET COMPOUNDS (GC)+++						
CARBON MONOXIDE	1.6	1.5	1.5	1.7	1.7	1.8
METHANE	10	9.9	9.9	10.7	10.5	10.5
HYDROGEN	2.2	2.2	2.3	3.2	3.3	3.2
CARBON DIOXIDE	5400	5900	5900	5800	6100	5600

<b>TOTAL CONCENTRATION (NON-METHANE HYDROCARBONS)</b>	<b>41</b>	<b>26</b>	<b>44</b>	<b>51</b>	<b>61</b>	<b>37</b>
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<b>TOTAL CONCENTRATION - OFP (NON-METHANE HYDROCARBONS)</b>	<b>8.2</b>	<b>8.9</b>	<b>9.5</b>	<b>7.5</b>	<b>7.6</b>	<b>8.4</b>
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**\* FROM GC/FID RESULTS**

**## Present, subject to large, random variability, therefore not quantifiable**

++ Measurements are quantified by single-point calibration.

+++ Measurements are calibrated by multi-point initial calibration and verified by mid-point continuing calibration.

++++ Book B-values are used for quantitation. B-values are referenced in the book "Compilation of Mass Spectral Data" by A. Cornu and R. Massot, 1966

< : Value is less than the laboratory report detection limit.

TRACE: Amount detected is sufficient for compound identification only.

TABLE 2  
ANALYTICAL RESULTS OF  
SOYUZ 25S RETURN MINI-GRAB SAMPLE CONTAINER AIR SAMPLES

CHEMICAL CONTAMINANT	T-VALUE (180-d SMAC)					
	AA05091 S/N 2055 LAB 04/13/11 @ 15:32 GMT	AA05092 S/N 2054 JEM 04/13/11 @ 15:35 GMT	AA05093 S/N 2053 SM 04/13/11 @ 15:40 GMT	AA05094 S/N 2063 COL 05/04/11 @ 13:17 GMT	AA05095 S/N 2040 SM 05/04/11 @ 13:27 GMT	AA05096 S/N 2065 LAB 05/04/11 @ 13:33 GMT
<b>TARGET COMPOUNDS (TO-14/POLAR)</b>						
FREON12	ND	ND	ND	ND	ND	ND
CHLOROMETHANE	ND	ND	ND	ND	ND	ND
FREON114	ND	ND	ND	ND	ND	ND
METHANOL	0.00736	0.00673	0.00787	0.00700	0.00693	0.00633
ACETALDEHYDE	0.03379	0.05334	0.04005	0.03754	0.03411	0.04967
VINYLCHLORIDE	ND	ND	ND	ND	ND	ND
BROMOMETHANE	ND	ND	ND	ND	ND	ND
ETHANOL *	0.00292	0.00312	0.00316	0.00248	0.00251	0.00277
CHLOROETHANE	ND	ND	ND	ND	ND	ND
ACETONITRILE	ND	ND	ND	ND	ND	ND
PROPENAL	ND	ND	ND	ND	ND	ND
ACETONE	0.00371	0.00520	0.00512	0.00423	0.00413	0.00509
PROPANAL	0.00605	0.00563	0.00745	0.00227	0.00227	0.00227
ISOPROPANOL	0.00401	0.00404	0.00579	0.00111	0.00113	0.00142
FREON11	ND	ND	ND	ND	ND	ND
FURAN	ND	ND	ND	ND	ND	ND
ACRYLONITRILE	ND	ND	ND	ND	ND	ND
PENTANE	ND	ND	ND	ND	ND	ND
2-METHYL-2-PROPANOL	ND	ND	ND	ND	ND	ND
METHYLACETATE	ND	ND	ND	0.00095	0.00104	0.00104
1,1-DICHLOROETHENE	ND	ND	ND	ND	ND	ND
DICHLOROMETHANE	ND	0.00250	0.00250	0.00250	ND	0.00250
3-CHLOROPROPENE	ND	ND	ND	ND	ND	ND
FREON113	ND	ND	ND	ND	ND	ND
N-PROPANOL	ND	ND	ND	ND	ND	ND
1,1-DICHLOROETHANE	ND	ND	ND	ND	ND	ND
BUTANAL	ND	ND	ND	ND	ND	ND
2-BUTANONE	ND	ND	ND	ND	ND	ND
CIS-1,2-DICHLOROETHENE	ND	ND	ND	ND	ND	ND
2-METHYLFURAN	ND	ND	ND	ND	ND	ND
ETHYLACETATE	0.00031	0.00047	0.00053	0.00140	0.00137	0.00159
HEXANE	ND	ND	ND	ND	ND	ND
CHLOROFORM	ND	ND	ND	ND	ND	ND
2-BUTENAL	ND	ND	ND	ND	ND	ND
1,2-DICHLOROETHANE	0.01563	0.01563	0.01563	0.01563	0.01563	0.01563
1,1,1-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND
N-BUTANOL	0.00258	0.00334	0.00400	0.00289	0.00303	0.00401
BENZENE	ND	ND	ND	ND	ND	ND
CARBONTETRACHLORIDE	ND	ND	ND	ND	ND	ND
2-PENTANONE	ND	ND	ND	ND	ND	ND
2-METHYLHEXANE	ND	ND	ND	0.00208	0.00208	0.00208
2,3-DIMETHYLPENTANE	ND	0.00208	0.00208	0.00208	0.00208	0.00208
PENTANAL	ND	ND	ND	ND	ND	ND
3-METHYLHEXANE	0.00208	0.00208	0.00208	0.00478	0.00469	0.00561
1,2-DICHLOROPROPANE	ND	ND	ND	ND	ND	ND
1,4-DIOXANE	ND	ND	ND	ND	ND	ND
TRICHLOROETHENE	ND	ND	ND	ND	ND	ND
2,5-DIMETHYLFURAN	ND	ND	ND	ND	ND	ND
N-HEPTANE	ND	ND	ND	ND	ND	ND
4-METHYL2-PENTANONE	ND	ND	ND	ND	ND	ND
CIS-1,3-DICHLOROPROPENE	ND	ND	ND	ND	ND	ND
2-PENTENAL	ND	ND	ND	ND	ND	ND
TRANS-1,3-DICHLOROPROPENE	ND	ND	ND	ND	ND	ND
1,1,2-TRICHLOROETHANE	ND	ND	ND	ND	ND	ND
TOLUENE	0.00463	0.00510	0.00504	0.00608	0.00589	0.00670
HEXANAL	ND	ND	ND	ND	ND	ND
MESITYLOXIDE	ND	ND	ND	ND	ND	ND
1,2-DIBROMOETHANE	ND	ND	ND	ND	ND	ND
BUTYLACETATE	ND	ND	0.00013	ND	ND	ND
OCTANE	ND	ND	ND	ND	ND	ND
TETRACHLOROETHENE	ND	ND	ND	ND	ND	ND
CHLOROBENZENE	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	ND	ND	ND	ND	ND	ND
M/P-XYLENES	ND	ND	ND	0.00068	0.00068	0.00068
2-HEPTANONE	ND	ND	ND	ND	ND	ND
CYCLOHEXANONE	ND	0.00042	0.00042	ND	ND	0.00042
HEPTANAL	ND	ND	ND	ND	ND	ND
STYRENE	ND	ND	ND	ND	ND	ND
1,1,2,2-TETRACHLOROETHANE	ND	ND	ND	ND	ND	ND
O-XYLENE	0.00177	0.00235	0.00288	0.00369	0.00399	0.00373
NONANE	ND	ND	ND	ND	ND	ND
1,3,5-TRIMETHYLBENZENE	ND	ND	ND	ND	ND	ND
1,2,4-TRIMETHYLBENZENE	ND	ND	ND	ND	ND	ND
1,3-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND
1,4-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND
1,2-DICHLOROBENZENE	ND	ND	ND	ND	ND	ND
1,2,4-TRICHLOROBENZENE	ND	ND	ND	ND	ND	ND
HEXACHLORO-1,3-BUTADIENE	ND	ND	ND	ND	ND	ND

**TABLE 2  
ANALYTICAL RESULTS OF  
SOYUZ 25S RETURN MINI-GRAB SAMPLE CONTAINER AIR SAMPLES**

CHEMICAL CONTAMINANT	T-VALUE (180-d SMAC)					
	AA05091 S/N 2055 LAB 04/13/11 @ 15:32 GMT	AA05092 S/N 2054 JEM 04/13/11 @ 15:35 GMT	AA05093 S/N 2053 SM 04/13/11 @ 15:40 GMT	AA05094 S/N 2063 COL 05/04/11 @ 13:17 GMT	AA05095 S/N 2040 SM 05/04/11 @ 13:27 GMT	AA05096 S/N 2065 LAB 05/04/11 @ 13:33 GMT
<b>TARGET COMPOUNDS (TOXIC)</b>						
1,3-BUTADIENE	ND	ND	ND	ND	ND	ND
ETHYLENE OXIDE	ND	ND	ND	ND	ND	ND
CARBON DISULFIDE	ND	ND	ND	ND	ND	ND
2-METHYL-2-PROPENAL	ND	ND	ND	ND	ND	0.01471
3-BUTEN-2-ONE	ND	ND	ND	ND	ND	ND
2-ETHOXYETHANOL	ND	ND	ND	ND	ND	ND
DIMETHYLDISULFIDE	ND	ND	ND	ND	ND	ND
OCTAMETHYLCYCLOTETRAILOXANE	##	##	##	##	##	##
<b>NON-TARGET COMPOUNDS</b>						
OCTAFLUOROPROPANE++	0.00038	0.00020	0.00040	0.00052	0.00062	0.00033
SULFURHEXAFLUORIDE	0.00009	0.00002	0.00008	0.00007	0.00011	0.00011
PROPENE	ND	ND	ND	ND	ND	ND
CHLORODIFLUOROMETHANE	ND	ND	ND	ND	ND	ND
CARBONYLSULFIDE	ND	ND	ND	ND	ND	ND
1-BUTENE	ND	ND	ND	ND	ND	ND
2-METHYL-1,3-BUTADIENE(ISOPRENE)	0.02074	0.02403	0.02371	0.02613	0.02449	0.03198
TRIMETHYLSILANOL	0.04880	0.06307	0.05420	0.05873	0.05580	0.07291
HEXAMETHYLCYCLOTRISILOXANE	##	##	##	##	##	##
LIMONENE	0.00022	0.00059	0.00089	0.00071	0.00074	0.00064
DECAMETHYLCYCLOPENTASILOXANE	##	##	##	##	##	##
<b>TARGET COMPOUNDS (GC)</b>						
CARBON MONOXIDE	0.09201	0.09014	0.09065	0.10005	0.10162	0.10357
METHANE	0.00287	0.00281	0.00283	0.00305	0.00301	0.00299
HYDROGEN	0.00643	0.00649	0.00676	0.00952	0.00965	0.00930
CARBON DIOXIDE	0.41258	0.45710	0.45764	0.44409	0.47137	0.43419
<b>TOTAL T-VALUE</b>	<b>0.66896</b>	<b>0.75646</b>	<b>0.74189</b>	<b>0.74026</b>	<b>0.75897</b>	<b>0.78435</b>
<b>TOTAL T-VALUE - OFF</b>	<b>0.66858</b>	<b>0.75626</b>	<b>0.74148</b>	<b>0.73974</b>	<b>0.75835</b>	<b>0.78401</b>

## Present, subject to large, random variability, therefore not quantifiable

< : Value is less than the laboratory report detection limit.

TRACE: Amount detected is sufficient for compound identification only.