

APPLICATION NOTE

LD16-01



Air analysis using the MultiDetek2 and PlasmaDetek2



▲ MultiDetek2

▲ PlasmaDetek2

LDETEK SOLUTION:

The air analysis for environmental applications is more and more required in different regions of the world. In this application note, the trace analysis of acids, sulfurs and nitrous oxide has been combined in one single compact instrument using one detection technology based on plasma emission (PlasmaDetek2). The MultiDetek2 compact GC has been configured with parallel channels to achieve the measurement at low ppb level for the different impurities. The sample collection can be performed with micro pump for ambient pressure application or bags, with a proportional micro valve for positive pressure application to control flow rate or with our auto injector headspace for vials. The MultiDetek2 was built using heated zones to avoid cold points between the columns and the plasma detector. The detector, valves, fittings and tubing are made of coated stainless steel to avoid surface adsorption. This ensures good sensitivity and repeatability measuring impurities.

RESULTS:

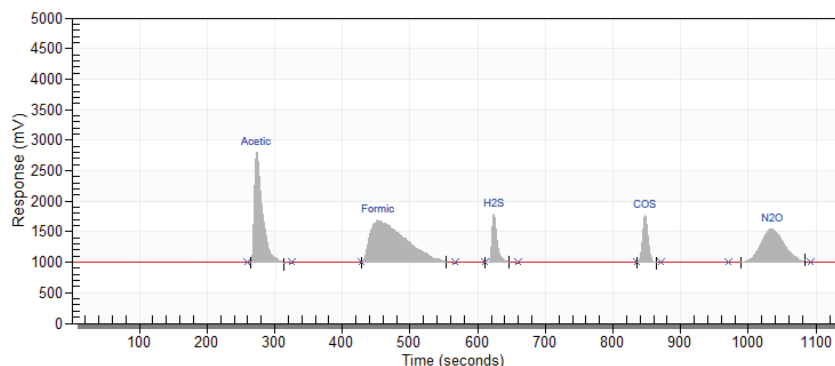


Figure 1:
Chromatogram of trace impurities in balance air

COMPONENT	CONCENTRATION	PEAK HEIGHT	NOISE	LDL (3X NOISE)
Acetic acid	0.27 ppm	2850 mV	36 mV	0.010 ppm
Formic acid	0.20 ppm	1785 mV	46 mV	0.015 ppm
H2S	3.00 ppm	1860 mV	1.6 mV	0.008 ppm
COS	3.00 ppm	1870 mV	1.9 mV	0.009 ppm
N2O	2.30 ppm	1595 mV	0.4 mV	0.001 ppm

Note: other LDL could be obtained with different injection volume and chromatographic conditions

Figure 2 : LDL based on 3 times noise ratio ▲

me	Acetic	Formic	H2S	COS	N2O
/2015 04:51:21	0.267	0.190	3.080	3.040	2.361
/2015 04:32:35	0.266	0.204	3.080	3.033	2.354
/2015 04:13:50	0.265	0.190	3.071	3.037	2.361
/2015 03:55:04	0.263	0.189	3.096	3.037	2.354
/2015 03:17:33	0.264	0.189	3.080	3.040	2.345
/2015 02:40:02	0.266	0.178	3.072	3.028	2.338
/2015 02:21:16	0.267	0.204	3.071	3.033	2.330
/2015 02:02:31	0.268	0.190	3.064	3.028	2.325
/2015 01:43:45	0.268	0.189	3.059	3.025	2.330
/2015 01:24:59	0.269	0.186	3.054	3.018	2.330
/2015 01:06:13	0.270	0.190	3.046	3.017	2.327
/2015 00:47:27	0.271	0.178	3.042	3.014	2.329
/2015 00:28:41	0.271	0.178	3.039	3.018	2.327
/2015 00:09:55	0.273	0.171	3.037	3.017	2.331

Figure 3 : Repeatability results

CONCLUSION:

Using a solution combining the PlasmaDetek 2 and the MultiDetek 2 is the best way to achieve sensitivity, robustness and speed in an industrial or laboratory compact system for air analysis.



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