

VA Application Note No. V - 85

Title: Elemental sulfur in gasoline

Summary: The concentration of elemental sulfur in gasoline is determined by polarography in acetate containing toluene/methanol electrolyte. The determination is linear up to 2 mg/L with respect to the concentration of elemental sulfur in the measuring vessel. Organic sulfur compounds are not detected with this method. The method is not suitable for diesel fuel, since diesel is not completely soluble in the used electrolyte. The gas wash bottle (6.2405.030) for inert gas supply has to be filled with supporting electrolyte.

Sample: Gasoline

Sample preparation: None

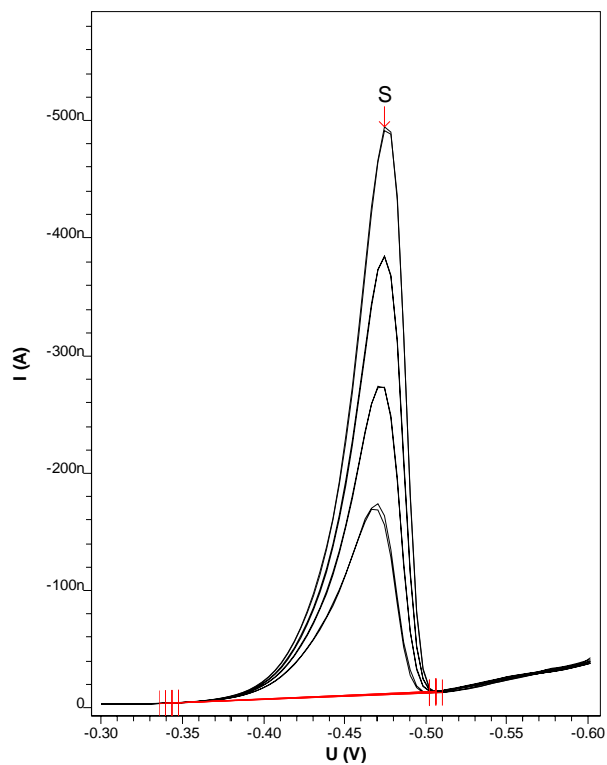
Analysis of sulfur

Supporting electrolyte	$c(\text{CH}_3\text{COONH}_4) = 0.19 \text{ mol/L}$ $c(\text{CH}_3\text{COOH}) = 0.088 \text{ mol/L}$ in toluene : methanol = 1:1													
Standard stock solution	$\beta(\text{sulfur}) = 1 \text{ g/L}$ dissolved in supporting electrolyte													
Measuring solution	8 mL supporting electrolyte + 4 mL gasoline													
Working electrode (WE)	MME (Multi Mode Electrode)	6.1246.020												
Auxiliary electrode (AE)	Pt	6.0343.000												
Auxiliary electrode (AE)	GC													
	electrode holder	6.1241.020												
	glassy carbon rod	6.1247.000												
Reference electrode (RE)	Reference system: Ag/AgCl/KCl (3 mol/L)	6.0728.020												
	Intermediate electrolyte: $c(\text{LiCl}) = 0.1 \text{ mol/L}$ in ethanol	6.1245.010												
Parameters	<table border="1"> <tbody> <tr> <td>Working electrode</td> <td>DME</td> </tr> <tr> <td>Stirrer speed</td> <td>2000 rpm</td> </tr> <tr> <td>Mode</td> <td>DP</td> </tr> <tr> <td>Purge time</td> <td>300 s</td> </tr> <tr> <td>Addition purge time</td> <td>40 s</td> </tr> <tr> <td>Equilibration time</td> <td>10 s</td> </tr> </tbody> </table>		Working electrode	DME	Stirrer speed	2000 rpm	Mode	DP	Purge time	300 s	Addition purge time	40 s	Equilibration time	10 s
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Pulse amplitude	0.05 V
Start potential	-0.3 V
End potential	-0.6 V
Voltage step	0.004 V
Voltage step time	1 s
Sweep rate	0.004 V/s
Peak potential sulfur	-0.47 V

Results:	sulfur
	0.19 mg/L

Determination of sulfur



S
 c = 0.188 mg/L
 +/- 0.003 mg/L (1.43%)

