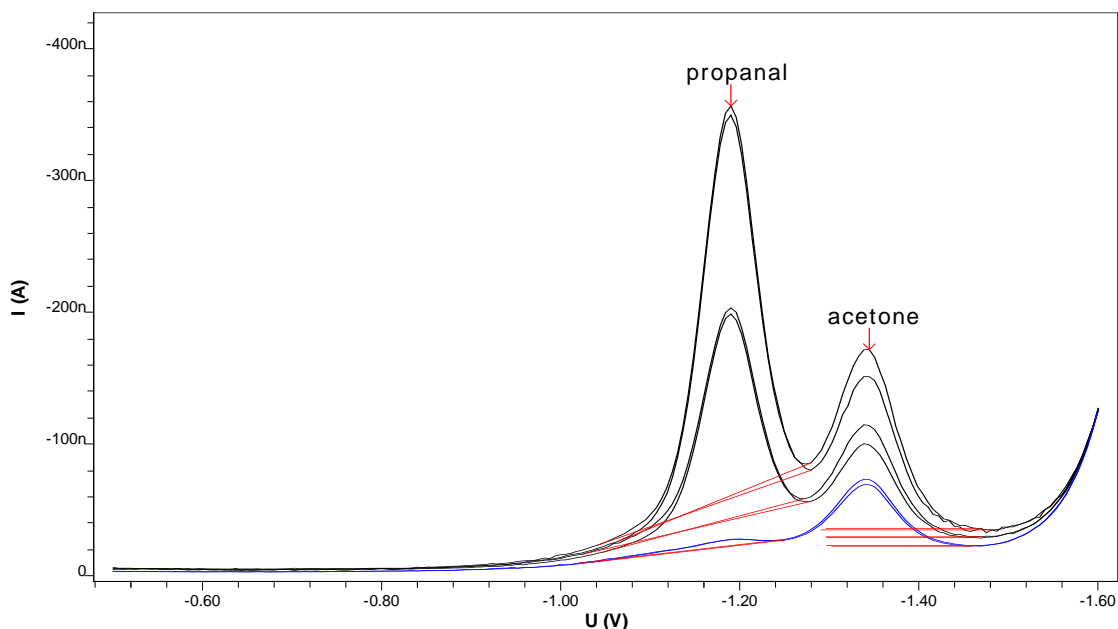# Determination of acetone and propanal in isopropanol

High purity solvents are used in a wide variety of industries. Impurities in high quality solvents can cause application issues such as side reactions, interferences, and low sensitivity. One class of impurity include carbonyl compounds. This work demonstrates the determination of carbonyl impurities in isopropanol using polarography.

Results

Propanal in isopropanol	0.3 mg/L
Acetone in isopropanol	9.7 mg/L

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Method description

Sample

Isopropanol, propan-2-ol, isopropyl alcohol

Instrument

797 VA Computrace

Electrodes

Multi-Mode Electrode pro Silanized glass capillaries	6.1246.120 6.1226.030
Ag/AgCl/KCl (3 mol/L) reference electrode. Bridge electrolyte: KCl (3 mol/L)	6.0728.020 6.1245.010
Platinum rod electrode:	6.0343.000

Reagents

Hydrazine sulfate	For analysis, CAS 10034-93-2
Sodium dihydrogen phosphate NaH_2PO_4	For analysis, CAS 7558-80-7
Disodium hydrogen phosphate Na_2HPO_4	For analysis, CAS 7558-79-4
Propanal	For analysis, CAS 123-38-6
Acetone	For analysis, CAS 67-64-1
Ultrapure water	Resistivity > 18 M©·cm (25 C), type I grade (ASTM D1193)

Solutions

Hydrazine sulfate solution	w(hydrazine sulfate) = 2 %
Phosphate buffer pH 6.8	c(sodium dihydrogen phosphate) = 0.167 mol/L c(disodium hydrogen phosphate) = 0.141 mol/L
Propanal standard solution	β(propanal) = 50 mg/L
Acetone standard solution	β(acetone) = 50 mg/L

Analysis

Measuring solution	9.8 mL ultrapure water + 3.2 mL sample + 10 mL phosphate buffer + 2 mL hydrazine sulfate solution

Parameters

Working electrode	DME
Stirrer speed	2000 min^{-1}
Mode	DP
Purge time	300 s
Pulse amplitude	0.05 V
Start potential	-0.49 V
End potential	-1.6 V
Voltage step	0.006 V
Voltage step time	0.3 s
Sweep rate	0.02 V/s
Peak potential propanal	-1.2 V
Peak potential acetone	-1.3 V

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