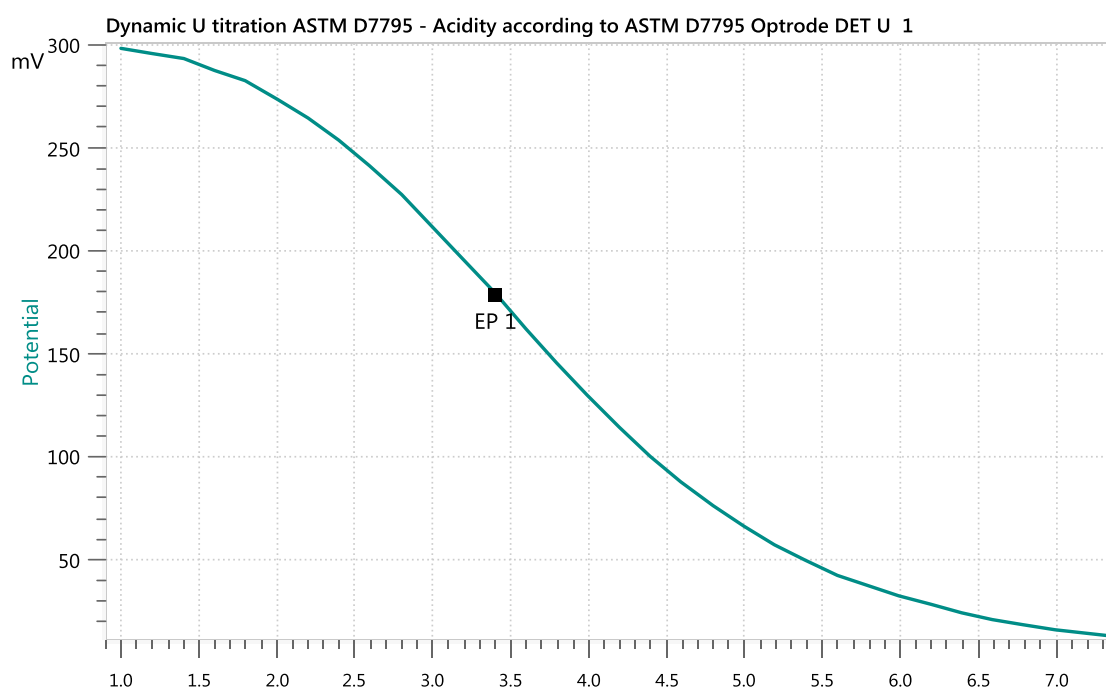


Photometric determination of acidity in ethanol according to ASTM D7795



Denatured fuel ethanol may contain additives such as corrosion inhibitors and detergents as well as contaminants from manufacturing that can affect the acidity of produced ethanol fuel. An increased acid content in solvents could lead to a variety of problems like a shorter storage stability or chemical corrosion.

Using the Optrode with phenolphthalein as indicator, the acidity is determined as acetic acid by titration with sodium hydroxide as titrant.

Method description

Sample

Denatured ethanol spiked with acetic acid (30 mg/kg acetic acid)

Sample preparation

No sample preparation is required.

Configuration

OMNIS Sample Robot S with one Pick&Place module and pump module (2-channel)	2.1010.1010
OMNIS Titrator Advanced without stirrer	2.1001.0210
OMNIS 10 mL cylinder unit	6.03001.210
Analog measuring module	6.02101.010
Electrode cable plug-in head G / plug P, 1.5 m	6.02104.010
Stirring propeller 30 mm ETFE	6.01900.010
OMNIS adapter cable for Optrode	6.02109.000
OMNIS Stand-alone license (including one instrument license)	6.06003.010
OMNIS instrument license, 1x	6.06002.010
Optrode	6.1115.000

Solutions

Titrant	c(NaOH) = 0.01 mol/L, if possible this solution should be bought from a supplier.
Phenolphthalein indicator solution	β (phenolphthalein) = 10 g/L 1 g phenolphthalein is weighed into a 100 mL volumetric flask. The flask is then filled up to the mark with ethanol.
Carbon dioxide free deionized water	10 L deionized water is purged with nitrogen for 1 hour.

Analysis

55 g to 65 g sample is weighed into a titration beaker and 2 mL phenolphthalein indicator solution is added. The solution is then purged prior the titration with nitrogen at a flow rate of 400 mL/min \pm 20 mL/min for 120 s and then the solution is titrated with c(NaOH) = 0.01 mol/L until after the equivalence point. After each titration, the solution is aspirated and the buret tips as well as the electrode are rinsed with carbon dioxide free deionized water.

Parameters

Mode	DET U
Wavelength	574 nm
Pause	30 s
Start volume	1 mL
Stirring rate	10
Signal drift	10 mV/min
Min. waiting time	10 s
Max. waiting time	52 s
Meas. point distance	4
Min. increment	200 μ L
Max. increment	200 μ L
Dosing rate	Maximum
Stop volume	10 mL
Stop measured value	50 mV
Stop EP	1
Volume after EP	5 mL
EP criterion	5
EP recognition	Last

Results

Sample (n = 6)	Acidity / mg/kg	s(rel) / %
Denatured ethanol spiked with acetic acid (30 mg/kg acetic acid)	31.3	2.5