NR	1671
Date:	03-Feb-05

Application Data Sheet

Free & Total Acid, Nitrite & Zinc

Matrix

Phosphatizing bath.

Principle

Free & Total acid are determined in an acid/base titration with NaOH.
Nitrite can be determined by back-titration of cerium(IV) excess with iron(II) in sulfuric acid environment. The nitrite reacts with cerium(IV). The non-reacted cerium is titrated using iron(II). Zinc is determined in a complexometric titration with EDTA.

Detection method

	Method:	Detector	Ion:	λ:
Acid, Free	Titration - Acid/base	pH Glass electrode	n.a.	n.a.
Acid, Total	Titration - Acid/base	pH Glass electrode	n.a.	n.a.
NO2-	Titration - Redox	Pt electrode	n.a.	n.a.
Zn2+	Titration - Complexometric	ISE	Cu	n.a.

Specification

	Range	Standard Dev.	Repeatability	Inaccuracy	Analysis time
Acid, Free	0.01 - 0.1 mol/l		< +/- 0.002 mol/l	< +/- 0.002 mol/l	10 minutes
Acid, Total	0.01 - 0.1 mol/l		< +/- 0.002 mol/l	< +/- 0.002 mol/l	in total
NO2-	20 - 200 mg/l		< +/- 4 mg/l	< +/- 4 mg/l	10 minutes
Zn2+	0.3 - 6 g/l		< +/- 0.06 g/l	< +/- 0.06 g/l	10 minutes

Interferences

Nickel does not interfere.

Reagents

0.1 M NaOH	
0.1 M Ce(SO4)2	0.9 ml per analysis
2 M H2SO4	5 ml per analysis
0.05 M Fe2+	
0.1 M DMG (dimethylglyoxim)	2 ml per analysis
NH3/NH4Cl buffer with Cu-EDTA	5 ml per analysis
0.1 M EDTA	

Procedure

Before all analyses clean the analysis vessel with water.
Free & Total acid:
- take 10 ml of sample and perform endpoint titration to pH 4.2 with NaOH
- perform endpoint titration to pH 8.6 with NaOH and calculate results

Nitrite:
- add Ce(SO4)2, add H2SO4 and take 10 ml of sample
- perform back-titration with Fe(II) and calculate result

Zinc:
- take 10 ml of sample and add water, add NH3/NH4Cl buffer and add DMG
- perform titration with EDTA, calculate result and add H2SO4 (dissolve the precipitate)

Remarks

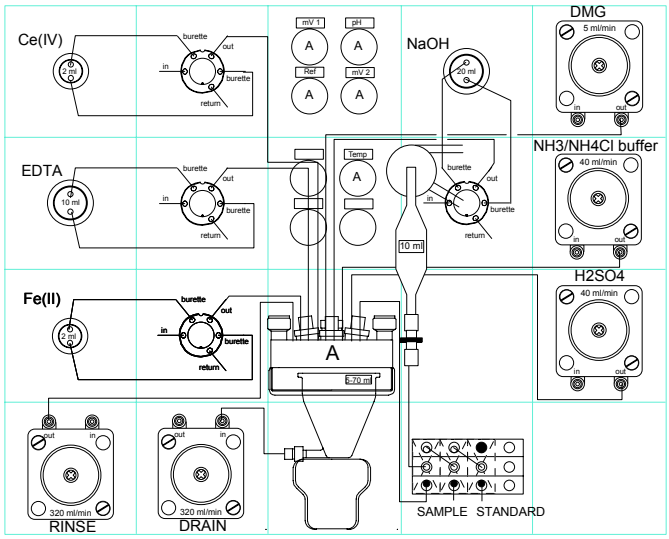
To enlarge the lifetime of the Cu-ISE you can position the electrode at a height so it will only be in contact with the solution when the zinc determination is carried out.

Possible Analyzer

- [x] 2040
- [ ] 2016
- [ ] 2018 HD
- [ ] 2019 HD
- [ ] 2019 Special
- [ ] 2003 Alert
- [ ] 2004 Alert

Typical Wet Part layout

(Other layouts may be realised in order to meet desired criteria, e.g measuring range.)



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