NR	1518
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Application Data Sheet — Sulfuric acid & Zinc

Matrix

Zinc sulfate.

Principle

The amount of sulfuric acid is determined by titrating with sodium hydroxide to the first inflection point.
H2SO4 + 2 OH- ==> 2 H2O + (SO4)2-
After the determination of sulfuric acid, a buffer-solution made of H2SO4 and (NH4)2SO4 is added and a titration with K4Fe(CN)6/K3Fe(CN)6 solution to first inflection point is carried out to determine the amount of zinc.
3 Zn2+ + 2 K4[Fe(CN)6] ==> K2Zn3[Fe(CN)6]2 (s) + 6 K+
Zinc-ions form in neutral or acidic medium with K4Fe(CN)6 an insoluble complex of potassium - zinc - ferrocyanide. An equilibrium exists between the ferrocyanide {K4Fe(CN)6} and the ferricyanide {K3Fe(CN)6} redox couple.

Detection method

	Method:	Detector	Ion:	λ:
H2SO4	Titration - Acid/base	pH Glass electrode	n.a.	n.a.
Zn2+	Titration - Redox	Pt electrode	n.a.	n.a.

Specification

	Range	Standard Dev.	Repeatability	Inaccuracy	Analysis time
H2SO4	50 - 200 g/l	< 0.4 g/l	+/- < 1 g/l	+/- < 1 g/l	10 minutes
Zn2+	10 - 90 g/l	< 0.4 g/l	+/- < 1 g/l	+/- < 1 g/l	in total

Interferences

Other strong acids and metals that react with sodium hydroxide.
No disturbance by the presence of a few g/l Ca or Mg in the sample.
Barium and Strontium precipitate with ferrocyanide. Manganese (Mn2+) reacts with ferro cyanide but so slowly, that it does not effect the Zinc analysis.

Reagents

NaOH (0.5 M)
(NH4)2SO4 - H2SO4 Buffer 5 ml per analysis
K4Fe(CN)6 (0.1 M)

Procedure

H2SO4:
- clean the analysis vessel with water
- take 1 ml of sample and transfer to the analysis vessel with carrier solution
- perform titration with NaOH and calculate result

Zinc:
- clean the analysis vessel with water
- take 1 ml of sample and transfer to the analysis vessel with carrier solution
- add (NH4)2SO4 - H2SO4 Buffer
- perform titration with K4Fe(CN)6 and calculate result

Remarks

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.)