

AQUACOUNTER Application Sheet	COM series	DATA No. C6	1st edition
Cosmetics	Quantification of sodium sulfate in bath agent using lead ion electrode		

1. Measurement outline

Sodium sulfate contained in bath agent is quantified by precipitation titration with lead perchlorate as titrant using lead ion electrode.



2. Reagents and Electrodes

(1) Reagents	Titrant	0.02mol/L lead perchlorate
	Loading buffer and solvent	98% acetic acid
		Special grade ethanol
(2) Electrodes	Indicator electrode	Lead Ion electrode 8008-10C manufactured by HORIBA.
	Reference electrode	Double-junction type reference electrode 2535A-10T (HORIBA) *Potassium nitrate solution used as the external solution. or Silver reference electrode RE-241 (P/N D230096-A)

3. Measurement conditions example (COM-1600S)

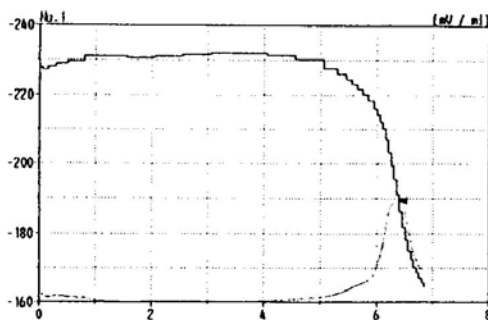
Master File No.1 Condition file: 1	
Parameters for Condition file 1	
Method	AUTO
Amp No.	1
Buret No.	1
Meas Unit	mV
S-Timer	30 sec
CP	0 mL
DP	0 mL
Direction	N/A
End Sens	200
Over mL	0.10 mL
Max Vol	20 mL
Mode No.	9
Unit	%
Formula	(D-B)×K×F×M/(S×10)
Blank	0
Molarity	0.02
Factor	Titer of the titrant
K	142.040 (as Na ₂ SO ₄)

Mode No.9	
Pre Int	0 sec
Del K	2
Del Sens	0 mV
Int Time	5 sec
Int Sens	3 mV
Brst Speed	2
Pulse	40

4. Procedure

- 1) Take approximately 1g of sample weighed accurately and added 100mL of deionized water to dissolve the sample.
- 2) 1mL of this sample solution is collected. Add 2mL of acetic acid to neutralize the carbonate salt contained in the sample.
- 3) Add 40mL of methanol and then lower the electrodes into the sample solution to titrate with lead perchlorate titrant.

5. Measurement example



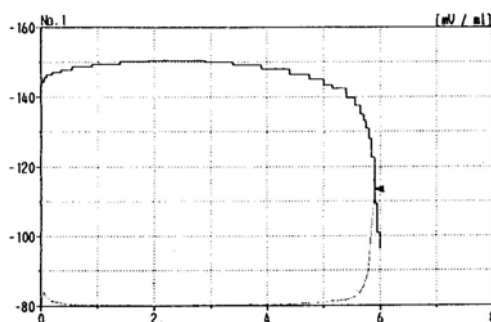
Measurement results

Sample No.	Sample volume (g)	Titration value (mL)	Content (%)
1	0.9977	6.366	38.79
2	0.9977	6.429	39.17
3	0.9977	6.425	39.17
Avg.			39.72 %
Std. Dev.			0.21 %
C.V.			0.54 %

6. Note

- 1) Standardization of titer of the titrant

The following shows the results of standardization by 5mL of 0.025mol/L standard sulfuric acid diluted with 40mL of methanol for titration with 0.02mol/L lead perchlorate.



Standardization results

Sample No.	Titration value (mL)	Titer/factor
1	5.885	1.071
2	5.885	1.071
3	5.890	1.070
Avg.		1.071
Std. Dev.		0.001
C.V.		0.05 %

- 2) Effect of interfering ions

Depending on the type of sample, it was impossible to obtain titration curve due to the interfering ions with the sample preparation method adopted in this section. In such cases, reducing the size of sample until smaller than 1/5 is effective to detect the end points. However, the titration value was also reduced to 1mL or smaller with small potential change for titration curve, leading to unfavorable repeatability.

Key words

Bath article, sodium sulfate, precipitation titration, lead ion electrode, lead perchlorate

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