AQUACOUNTER Application Sheet	COM series	DATA No. C5	1st edition

Cosmetics — Quantification of magnesium sulfate in bath article

1. Measurement outline

Magnesium sulfate contained in bath articles is quantified by chelatometric titration.

$$MgSO_4 + Na_2EDTA \rightarrow MgEDTA + NaSO_4$$

2. Reagents and Electrodes

(1) Reagents	Titrant	0.05mol/L EDTA titrant
	Indicator	EBT indicator
	pH10 buffer NH_4CL (7g) and ammonia water 57mL are added to deionized water to the total volume of 100mL.	
(2) Electrodes	Photometric probe with 650nm filter	

3. Measurement conditions example (for COM-1600M w/ Photometric unit)

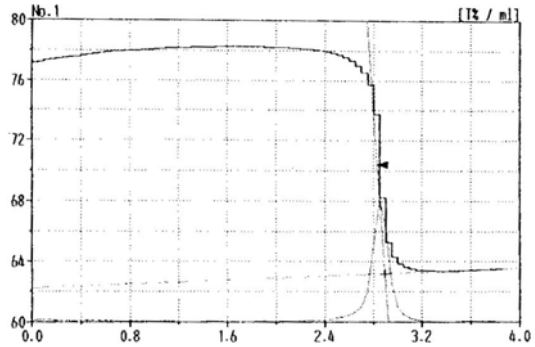
Master File No.1 **Condition file: 1**	
Parameters for Condition file 1	
Method	B Cross
Amp No.	2
Buret No.	1
Meas Unit	T%
S Timer	10 sec
CP	0 mL
DP	0 mL
End Sens	100
Over mL	1.00 mL
Max Vol	20 mL
Mode No.	21
Unit	%
Formula	(D-B)×K×F×M/(S×0.4)
Blank	0
Molarity	0.05
Factor	Titer of the titrant
K	174.4144 (as $MgSO_4 \cdot 3H_2O$)

Mode No.21	
Pre Int	0 sec
Del K	0
Del Sens	0 mV
Int Time	10 sec
Int Sens	0 mV
Brt Speed	2
Pulse	40

4. Procedure

1) Take approximately 15g of sample weighed precisely.
2) Add deionized water to make the volume 250mL. Then add approximately 10g of silicic anhydride and stir well to decolorize the pigments contained in sample.
3) Put this solution on a centrifuge to separate the white components.
4) Collect 10mL of supernatant fluid in a beaker. Add 5mL of pH10 buffer, 40mL of deionized water and approximately 5 drops of EBT indicator (eriochrome black T).
5) Immerse the photometric probe into the solution, and then titrate with EDTA titrant.

5. Measurement example



Measurement results

Sample No.	Sample volume (g)	Titration value (mL)	Content (%)
1	15.0180	2.876	4.221
2	15.0180	2.884	4.204
3	15.0180	2.889	4.211
	Avg.		4.212 %
	Std. Dev.		0.085 %
	C.V.		0.20 %

6. Note

1) Many of bath articles are colored with pigments and they may affect the color change of indicator. Thus it is necessary to remove the pigments in the appropriate way. Though pigment removal method with silicic anhydride was used in this section, the pigments could not be removed completely. Therefore, the color change of EBT indicator varies by the effect of pigments. However, it did not affect the measurement results.
2) It must be noted that the total amount of magnesium and calcium will be measured in this method if the sample contains calcium. In this case, magnesium can be quantified by measuring the level of calcium alone by another method (see Data No.C7), and then subtract the calcium concentration from the measurement result of this method.

Key words

Bath article, chelatometric titration, photometric titration, eriochrome black T, EBT indicator

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