

AQUACOUNTER Application Sheet	COM series	DATA No. H5	1st edition
Paper and Pulp	Quantification of residual alkali in sodium hypochlorite		

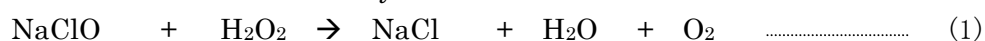
1. Measurement outline

The manufacture method for sodium hypochlorite comprises of chlorine gas absorption into sodium hydroxide. There is sodium chloride formed by decomposition of sodium hydroxide and hypochlorous acid in the manufactured sodium hypochlorite. This section introduces an example in which the residual alkali content (mainly NaOH + Na₂CO₃) contained in sodium hypochlorite was measured using potentiometric titration method.

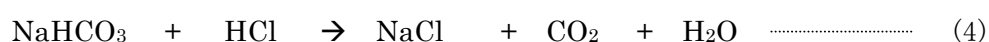
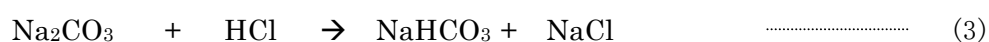
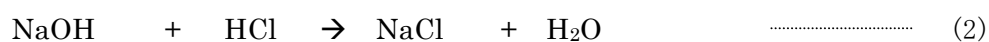
(1) Approximately 10g of sample is collected in a 100mL beaker and weighed precisely.

(2) 50mL 3% hydrogen peroxide solution is added gradually to decompose sodium hypochlorite.

It needs to be added carefully since the reaction is violent.



(3) It is titrated with 0.1mol/L hydrochloric acid titrant.



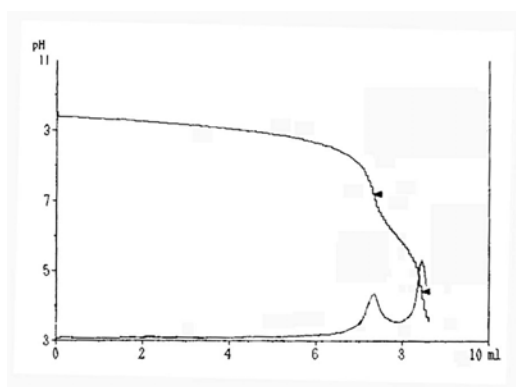
2. Reagents and Electrodes

(1) Reagents	Titrant	0.1mol/L hydrochloric acid titrant
	Loading buffer	50mL 3% hydrogen peroxide solution
(2) Electrodes *standard accessories	Indicator electrode	*Glass electrode GE-101B to IE jack
	Reference electrode	*Reference electrode RE-201 to RE jack

3. Measurement conditions example (for COM-1600S)

Master File No.1					
Condition file: 1 + 2					
Parameters for Condition file 1 (For 1 st End point)		Parameters for Condition file 2 (For 2 nd End point)		Mode No.2	
Method	AUTO	Method	AUTO	Pre Int	0 sec
Amp No.	1	Amp No.	1	Del K	5
Buret No.	1	Buret No.	1	Del Sens	0 mV
Meas Unit	pH	Meas Unit	pH	Int Time	1 sec
S-Timer	10 sec	S-Timer	0 sec	Int Sens	3 mV
CP	0 mL	CP	0 mL	Brst Speed	2
DP	0 mL	DP	0 mL	Pulse	40
End Sens	500	End Sens	500		
Over mL	0 mL	Over mL	0 mL	Mode No.3	
Max. Vol.	10 mL	Max. Vol.	20 mL	Pre Int	0 sec
Mode No.	3	Mode No.	2	Del K	2
Unit	mL	Unit	%	Del Sens	0 mV
Formula	$(V_A - V_B) \times K \times F \times M / (S \times 10)$	Formula	$2 \times V_B \times K \times F \times M / S \times (10)$	Int Time	1 sec
Blank	0	Blank	0	Int Sens	3 mV
Molarity	0.1	Molarity	0.1	Brst Speed	2
Factor	Titer of the titrant	Factor	Titer of the titrant	Pulse	40
K	40	K	53		

4. Measurement example



Measurement results on NaOH

Sample No.	Sample volume (g)	Titration value (mL)	Concentration (%)
1	11.55	7.325	0.4395
2	11.55	7.282	0.4289
3	11.55	7.315	0.4321
Avg.			0.4320 %
Std. Dev.			0.003 %
C.V.			0.69 %

Measurement results on Na₂CO₃

Sample No.	Sample volume (g)	Titration value (mL)	Concentration (%)
1	11.55	1.084	0.2002
2	11.55	1.127	0.2081
3	11.55	1.114	0.2057
Avg.			0.2047 %
Std. Dev.			0.0041 %
C.V.			2.0 %

Measurement results for total alkali (converted to NaOH)

Sample No.	Sample volume (g)	Titration value (mL)	Concentration (%)
1	11.55	8.409	0.5859
2	11.55	8.409	0.5859
3	11.55	8.429	0.5873
Avg.			0.5864 %
Std. Dev.			0.0008 %
C.V.			0.14 %

5. Outline

Precautions in measurement

It is necessary that excessive hydrogen peroxide be added against sodium hypochlorite in order to decompose the sodium hypochlorite contained in the sample. If sodium hypochlorite remains, it will result in titration value being added to the second step of the titration curve.

Key words

Quantification of residual alkali in sodium hypochlorite, hydrogen peroxide, neutralization titration

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