ENVIROTECH

BROMMAX

LAB PROCEDURE

Determination of the Activity of Aqueous Bromine-Containing Solutions By Iodometric Titration

STANDARD OPERATING PROCEDURE:
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Apparatus

- Digital burette capable of dispensing in single increments of 0.01 ml with accuracy +/- 0.2%
- Erlenmeyer flask (125 ml)
- Magnetic stirrer and stir bar
- Analytical balance capable of reading 0.001 g

Reagents

- De-ionized or reverse osmosis water
- Potassium iodide crystals, ACS
- Glacial acetic acid, trace-grade 99.7% min.
- 0.100N sodium thiosulfate, $Na_2S_2O_3$ *
- Starch indicator solution, 1%w/v, for iodometric titrations

Procedure

(1) Accurately weigh (4 decimal places) approximately 0.2 g of aqueous brominecontaining solution to a 125 ml Erlenmeyer flask.

(2) Dilute with 50 ml de-ionized or reverse osmosis water and add a magnetic stir bar.

(3) Add 5 ml glacial acetic acid and 1 g potassium iodide

(4) With stirring, titrate the liberated iodine with 0.100N sodium thiosulfate ($Na_2S_2O_3$) until the solution turns a faint straw color.

(5) Add 1 ml of starch indicator solution, and add the titrant dropwise to discharge the blue coloration. Record the volume (VA/ml).

(6) Perform a blank determination by repeating steps (2)-(5). Record the volume

(VB). Note that VB may be zero.

Calculation

To express the results as weight % available Cl_2 use:

$$\text{Wt \% available } Cl_2 = \frac{(V_A - V_B)/\text{ml} \times \text{N } Na_2S_2O_3 \times 0.03545 \times 100}{\text{Wt. of sample/g}}$$

** The 0.1 N sodium thiosulfate must be standardized using ASTM or ACS procedures*

Background

Under acidic conditions, the active ingredient in aqueous bromine-containing solutions quantitatively liberates iodine from excess potassium iodide. The iodine is titrated with a standard solution of sodium thiosulfate, and a starch indicator is introduced near the endpoint. The volume of titrant required is used to calculate the activity of the brominecontaining solution.

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