POTENTIOMETRIC METHOD FOR THE DETERMINATION OF CHLORIDE IN SOLUTIONS CONTAINING CHROMIC ACID

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Chloride content in the chromic acid anodizing baths should be kept below 0.02% (as sodium chloride). The titrimetric method for chloride [1] can not be straight adopted here because of the interference of chromic acid. The method currently adopted is to precipitate chloride as silver chloride in nitric acid medium and determine chloride gravimetrically.

In the present paper a method is described which makes chromate innocuous and potentiometric titration for chloride deterimination can be carried out successfully.

EXPERIMENTAL

A saturated calomel electrode is prepared as described in literature [2] in a bottle of 150 ml capacity. A salt bridge (of 0.5 N $NaNO_3$) is used to make the final connection to the titration cell. The titration cell is a beaker and stirring during titration is effected an a magnetic stirrer. A silver wire is used as an indicating electrode. The standard silver nitrate (0.01 N) is added from a burelte during titration. A millivoltmeter (from the auto titrator of Systronics make) is used to measure the potentiar.

20 ml standard (0.02 N) sodium chloride is made acidic with HNO_3($pH < 1$) and titrated with 0.01 N $AgNO_3$. The potential vs volume of $AgNO_3$ gives a typical S shaped curve of potentiometric titrations. The inflection point is taken as the end point.

An aliquot of the anodizing solution is made alkaline with sodium hydroxide and reduced with sulphurous acid till yellow colour disappears. This is made up to a volume. An aliquot of this is taken, a known volume of standard NaCl solution is added, solution made acidic and titration carried out as before. The chloride content is calculated.

RESULTS

Titration with standard solution shows that the end point occurs at the expected point. Four samples of good anodizing baths are titrated. The graph are given in Fig. 1.

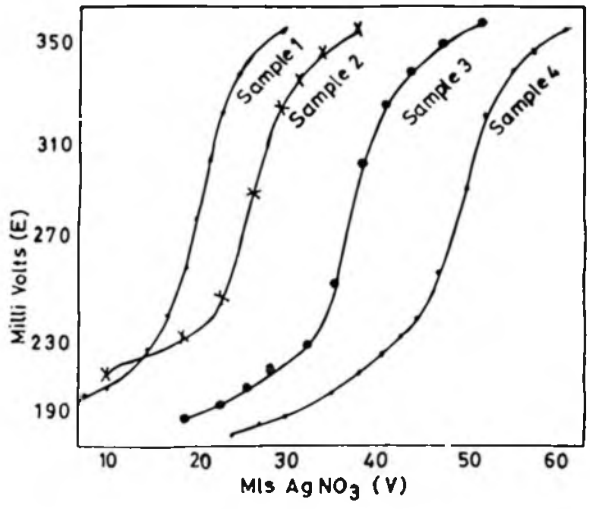


Fig. 1

50 ml of contaminated picking bath is made alkaline, reduced, diluted to 400 ml and allowed to stand. 100 ml of clear solution is pipetted and 10 ml of 0.02 N NaCl is added, made acidic and titration is carried out. The chloride content in the original solution calculated.

The value obtained for chloride is 0.36 g/L against a value of 0.33 g/L by gravimetric method.

ACKNOWLEDGEMENT

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REFERENCE

1. *Analytical Chemistry* Ed. C.R.N. Strouts, JH Gilfillan, H.N. Wilson.

2. EWING *Instrumental Methods of Chemical Analysis.*

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1. N. Schwarz, M. Gresh and S. Karlik, *J. Electrochem.Soc.*, **108-8**, (1967) 7. [Volume Number (year) page]

2. H.H. Uhlig, *Corrosion and Corrosion Control* (2nd Ed) (1971), Wiley-Interscience, New York, p.147.

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