

SHORT COMMUNICATIONS

PHOTOMETRIC DETERMINATION OF CHROMIUM (VI)

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CHROMIUM exists in +3 and +6 oxidation states in solution^{1,2}, the former being more stable. Spectrophotometric, atomic absorption, voltammetric or neutron activation analysis techniques are widely used for the determination of chromium in water. Dzharkesheva *et al*³ studied the redox reaction of chromium with ascorbic acid by amperometric method whereas Seshaiyah *et al*⁴ studied the potentiometric determination of chromium (VI) with ascorbic acid. We report in this communication the use of ascorbic acid for the spectrophotometric determination of chromium (VI).

Stock solution of chromium (VI) (1000 mg/100 ml) was prepared by dissolving potassium dichromate (AR) in redistilled water. Ascorbic acid solution was prepared by dissolving L-ascorbic acid in redistilled water.

Titrations were carried out using Spectrocol (Elico Model CL 23) spectrophotometer at 475 nm. Sulphuric acid (4 ml of 0.02 N) was taken in a cuvette and to this 0.2 ml potassium dichromate (analyte) was added. The analyte in the cuvette was titrated against 0.05 ml aliquots of ascorbic acid (titrant). The absorbance values for each addition were recorded against a blank solution in the reference cuvette.

Titrations were carried out in different concentrations of sulphuric acid and 0.02 N sulphuric acid was found to be the best since the results were close to the theoretical values. The absorbance data relating to these titrations are represented graphically in figure 1. The results show that two moles of ascorbic acid reduces one mole of chromium (VI).

The minimum quantity of Cr (VI) that can be estimated by the present method was 1.00 mg (with an error of $\pm 1.4\%$). This was found by titrating different quantities of chromium (VI) solutions with ascorbic acid.

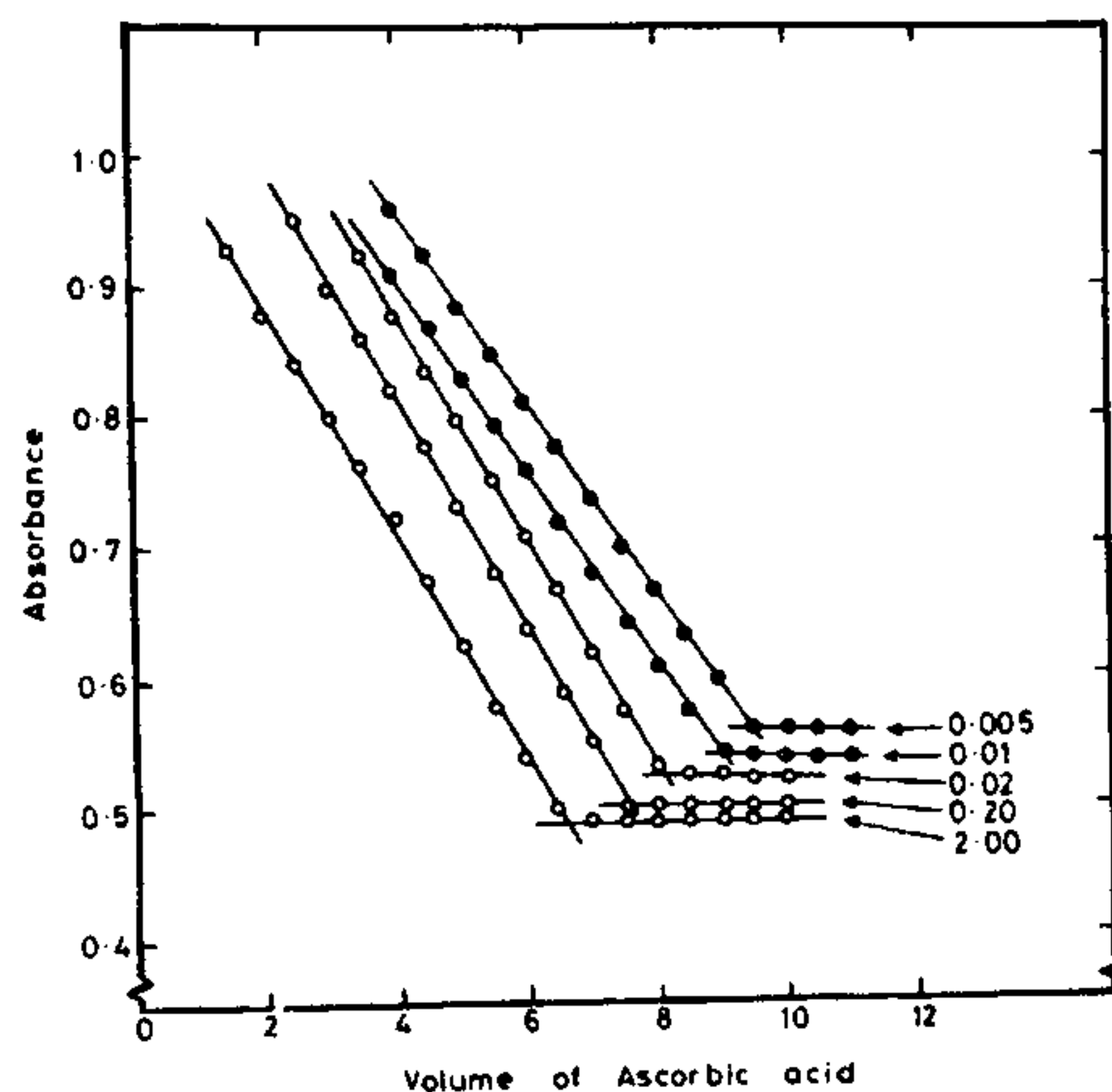


Figure 1. Photometric titration curves of Cr (VI) in H_2SO_4

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