Large excesses of fluoride, chloride, bromide, iodide, nitrate, chlorate have no effect on the sensitivity of the reagent.

Reference

1. Sandell: Colorimetric determination of traces of metals. New York: Intersc. Publ. Inc. 1944.

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Alizarin Red S as Metallochromic Indicator in the Complexometric Titration of Lead and Copper

Alizarinrot S als metallochromer Indicator
bei der komplexometrischen Titration von Blei und Kupfer

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The pink 1:1 complex of Alizarin Red S with Cu or Pb can be easily decomposed by EDTA at pH 5.5 to 6.0. This fact has been utilized for the complexometric titration of these metals. As the indicator itself acquires a pinkish tinge in that pH-range addition of methylene blue as a screening dye is necessary in the case of lead, the blue colour of the Cu-EDTA complex exerting a screening effect by itself.

Titration of Lead. To the acidic sample solution with < 100 mg of Pb/100 ml add 3 drops of 0.2% aqueous indicator solution for each 50 ml and an equal number of drops of 0.02% aqueous Methylene Blue solution. Adjust the pH to about 6 with solid hexamine and titrate the violet solution with 0.05 or 0.01 M EDTA solution to a sharp colour change to light grey or colourless. Near the end-point the solution acquires a pink colour. The pH at the end-point should most favourably be 5.7 to 6.0.

Titration of Copper. To the acidic sample solution with < 35 mg of Cu/100 ml add 0.6 to 0.7 ml of 0.2% aqueous indicator solution for each 15 mg of Cu. Adjust the pH to 5.5–6.0 with solid hexamine and titrate with standard EDTA solution to a sharp colour change from pink to green or dull green.

Calcium may cause interferences in end-point detection. In the case of lead warming of the solution

improves tolerance, in the case of copper addition of KF in the beginning of the titration is recommended. Magnesium and strontium do not interfere. Barium interferes only in the titration of copper. Even small amounts cause serious interferences. A permanent pink colour makes detection of the end-point impossible. Addition of K_2SO_4 before the addition of the indicator overcomes this difficulty. In the determination of lead, copper and mercury may be masked by thio-urea. KF has been found suitable for masking iron and aluminium in the determination of copper. In the latter case titration has to be carried out at pH 5.1 to 5.5, or a slight excess of EDTA can be added and then back-titrated at pH 5.5–6.0. End-points are sharp in both cases.

Very satisfactory results were obtained in employing the above method.

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1-(2-Quinolylazo)-2-phenanthrol (QAP) as a Visual Indicator for the Determination of Copper with EDTA

1-(2-Chinolylazo)-2-phenanthrol als visueller Indicator
zur Bestimmung von Kupfer mit EDTA

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1-(2-Quinolylazo)-2-phenanthrol (QAP) has been found to be a suitable indicator for the titration of Cu with EDTA. The pH-range within which the titration can be carried out is fairly wide (6.0 to 8.9), also the temperature range (20 to 50° C). The sensitivity of the proposed method is much higher than that obtained by the use of 1-(2-pyridylazo)-2-naphthol ($0.0014 \mu\text{g}/\text{cm}^2$ and $0.0034 \mu\text{g}/\text{cm}^2$ for $\log I_0/I = 0.001$). The following foreign ions can be tolerated in the amounts (mg) given in parentheses: thiocyanate (30), chloride (100), bromide (80), iodide (100), fluoride (100), iodate (40), borate (20), citrate (60), tartrate (40), nitrate (100), nitrite (100), oxalate (15), phosphate (5), magnesium (20), calcium (10), barium (6), strontium (14), manganese (5). Serious interferences are caused