

METHOD STATEMENT

Determinand:

Ferrous, Ferric and Total Iron (not UKAS accredited)

Matrix

Groundwater, leachates, effluents and wastewater

Principle of Method:

Ferrous iron

Ferrous iron in an acidified sample reacts with 1,10 phenanthroline in the presence of an ammonium acetate buffer to form an orange/red complex that is measured spectrophotometrically at 510 nm.

Total iron

Total iron is brought into solution by boiling with acidified hydroxylamine solution. The resulting ferrous iron in the acidified sample reacts with 1,10 phenanthroline in the presence of an ammonium acetate buffer to form an orange/red complex that is measured spectrophotometrically at 510 nm.

Ferric iron

Ferric iron is calculated as the difference between the total iron and ferrous iron results.

Sampling and Sample Preparation:

Samples are acidified at the time of sampling using 4 ml 50% v/v hydrochloric acid per 100 ml sample. Samples must be analysed as soon as possible after sampling.

Samples requiring total iron are boiled with acidified hydroxylamine solution to convert all iron present to ferrous iron

Interferences:

Ideally, this analysis should be carried out at the sampling site. If samples are analysed at the laboratory there is the possibility of change in the ferrous-ferric ratio with time. Strong oxidising agents, cyanide, nitrite, polyphosphates, chromium, zinc, cobalt, copper, nickel, bismuth, cadmium, mercury, molybdate and silver may cause interference.

Performance of Method:

Range of Application: 0.5 to 50 mg/l

Normal Reporting Level: 0.5 mg/l

Full performance characteristics have not been determined for this method.

References:

Standard Method for the Examination of Water and Wastewater. 20th edition. 1998. APHA, AWWA, WEF. ISBN 0-87553-235-7. Method 3500-Fe B, Phenanthroline Method.

