Technical Specification

Tests For: Nickel in Natural and Treated Water

Test Range: 0–10 mg/L

Reagent Chemistry Used: Nioxime

Method Detection Limit*: 0.04 mg/L

Limit of Quantification**: 0.14 mg/L

*The Method Detection Limit (MDL) is defined as the minimum measured concentration of a substance that can be reported with 99% confidence to be different from the method blank results.[i]

**The Limit of Quantification (LOQ) is the smallest quantity that can be detected with reasonable certainty for a given analytical procedure. [ii]

Testing for Nickel

Nickel does not occur naturally in water but is found in many industrial waste waters, such as those from the steel and plating industries. It is considered an undesirable constituent of water, and hence requires close and careful monitoring. The EU maximum admissible concentration for drinking water (MAC) is 0.02 mg/L (EFSA 2015).

The Palintest Nickel test method provides a simple test for the determination of nickel in water over the range 0–10 mg/L Ni. The test responds to both Ni^{2+} and Ni^{4+} and thus gives a measure of total soluble inorganic nickel content of the water.

Reagent Chemistry

In the Palintest Nickeltest method, nickel salts are reduced to the nickelous form and then reacted with nioxime indicator to give a pink coloured complex.

The reagents are provided in tablet form and the test is simply carried out by adding tablets to a sample of the water. The intensity of colour produced in the test is proportional to the nickel concentration and is measured using a Palintest Photometer.

Interferences

Reagents are included to prevent copper interference, and a complexing powder is provided to prevent iron interference.

The presence of cobalt at 0.5 mg/L gives a positive response in the test.

The presence of significant levels of EDTA (at least 25 mg/L) complexes nickel and reduces response in the test. Complexing agents used in water treatment, such as polyphosphates, do not affect the results.

[i] EPA, Definition and Procedure for the Determination of the Method Detection Limit, Revision 2, Dec 2016.
[ii] *IUPAC. Compendium of Chemical Terminology, 2nd ed. (the "Gold Book").*