



## MODERNWATER

### **How We Analyse Metals**

The metals must be dissolved in water. For effluents, the metal is already in solution (though some sample types may still require a digestion), but soil samples need to have the metal extracted.

The liquid sample is added into a supporting electrolyte (buffer) to ensure the oxidation states of the metal ions are optimised. This also dilutes the sample, which removes many of the potentially interfering compounds. Another component of the buffer removes any dissolved oxygen in the sample that might interfere with the analysis.

A standard is used to confirm that the analyser is working correctly.

The sample is then added to the cell and the metals electroplated onto the electrode at the correct voltage or potential. Not all of the metal in solution is plated onto the electrode, but the plating time is long enough to reduce sufficient metal onto the electrode to give a good signal.

During the plating process, the sample is mixed at high speed. This ensures that the metal ion concentration at the electrode/sample interface is the same as the concentration in the bulk sample.

The potential is then altered in a controlled way and the metals are stripped from the electrode. Each metal will strip from the electrode at a specific potential, which allows for identification of a metal.

The current generated by stripping is proportional to the metal concentration on the electrode.

The data can be plotted to give a graph of current against potential. This graph is called a voltammogram.