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## PRESENTATION

# ADOPTION OF COMMON SCHEMES FOR SINGLE AND SEQUENTIAL EXTRACTIONS OF TRACE METAL IN SOILS AND SEDIMENTS

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The various methods for determining the mode of occurrence of trace metals in sediments and soils have a long history which dates back to the determinations of the availability of metals for plant nutrition performed earlier. Various methods have been developed in the 70's and 80's dealing with both single and sequential extraction schemes. Although some schemes received wide acceptance, none of them developed into a commonly accepted procedure. As a result, the information obtained was site-specific and the interpretation of the results scientist-specific.

The workshop on single and sequential extraction in sediments and soils held at Sitges can be considered as a "turning-point" because not only a single scheme was suggested and accepted by all the participants for an intercomparison, but this scheme will be possibly backed up by reference materials which will allow a good quality control of analysis. The adoption of such a scheme could lead to the development of an international norm (e.g. ISO, CEN). Therefore, results from different scientists can now, in principle, be compared and a common data base on the mode of occurrence of metals in soils and in sediments can be build-up.

This kind of comparable data sets have additional use if they are placed in an European or other regional context. It is now well established that total metal concentrations show poor correlation with either bio-availability for plants or organisms or for predicting the impact of contaminated sediments or soils on ground or surface water quality.

Geochemical maps of surface soils and sediments have been prepared on the basis of total concentrations. These maps allow to identify "hot spots" and can be used to classify polluted sites. However, by their nature they do not provide information on the reactivity, mobility or accessibility of the metals. For instance it is well known that chromium occurs at high levels in certain rock types where it is largely immobile. Extension of this type of maps to include the "reactivity" of the metals as determined by a common speciation scheme offers new possibilities. One can envisage maps which show the distribution of a certain metal fraction which is linked to plant availability or leachability. With this kind of regional

maps it will be possible to identify problem areas for further investigations and, in combination with soil properties, predict the impact of changing land use, large scale civil engineering activities or acid deposition on metal behaviour.

The results of the Sitges workshop will be a first step not only for the analytical chemists, soil chemists and geochemists to come to an agreed analytical procedure but even more so to come to one which has a large potential use for decision makers and governmental regulators. This impact on the future of single and sequential procedures for the determinations of extractable trace metals in soils and sediments can be illustrated by the following diagram:

