

**New approach of Transmission electron microscopy coupled with EDXS for Heavy metal speciation in environmental/ biological materials**

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The elemental speciation is largely required to understand the toxicology of particular heavy metal. Scientists always looking for unique non destructive technique, which can give the information of the particular metal within the cell and it's binding with different cellular material. The electron microscopy technique including scanning electron microscopy, transmission electron microscopy (TEM) coupled with EDXS has been used to evaluate heavy metal species from biological tissue which are environmentally exposed. Heavy metals present in tissues are arsenic, copper, cadmium chromium and mercury etc. These heavy metals bind to different protein and enzymes in our body. Heavy metal alteration and weathering feature can damage the cells.

The use of electron microscopic analysis is an important in present study which helps to evaluate heavy metal and mineral species in biological tissue and attempt to detect the localization of heavy metal in biological tissue. Several researchers used hyphenated techniques in combination with various types of chromatography with inductively coupled plasma mass spectrometry which is not capable to give the information of metal in which form due its destructive sample processing as well as its chemical property. In present status environmental speciation with the hyphenated techniques is required. There is a growing need for more comprehensive approaches including the direct analysis samples especially for the elemental speciation of heterogeneous materials with microscopic methods of analysis. Methods for solid-state speciation analysis with several types of beam methods of analysis needed to be reviewed.

The processing of the material should be very important step for estimation of heavy metals. The staining of biological materials should be avoided in case of heavy metals speciation. This technique is also utilized for speciation of different type of environmental materials. In case of biological material or biological tissues speciation can be done of different element within the cell. The speciation of different heavy metal is very informative for those who studying toxicology. We can localize bioavailability of different trace metal in tissues with the help of this technique.