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# Rare Earths in Environment via Synchrotrons

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Trace metals in the environment due to the effects of gases natural environments, such as rainwater clogging, mangroves, insects, marine fishes, and water pollution needs to investigated .Investigations of the problem of toxicity in the Environment needs to be studied .The useful ingredients of trace elements present in naturally occurring plants, herbs, and spices also needs to be studied It will elucidate medicines extracted from herbs, such as Ayurveda medicines and other alternative medicines for bioremediation and pyto-remediation. This work will be a useful source of information for doctors, environmentalists, researchers in biosciences, pharmaceuticals, and pharmacists. The work will enlighten spaces travellers to relate to atmospheric trace metal levels, considering the ozone layer. Trace metals in the environment will help bring down the toxicity in the environment by introducing environmentally friendly products for easier waste disposal. Waste to wealth should be the motto, and it can provide exact pictures of trace metals levels in all environment-related materials present in the universe. The determination of the trace-elemental composition especially rare earths of biological materials especially environment is a difficult and challenging experimental problem. It is necessary to determine small concentrations of many elements.in the presence of major concentrations of hydrogen, carbon, and oxygen. The sample is generally. Heterogeneous on a very small scale. Biological material is generally wet and not readily compatible with a vacuum system, or it may require extensive preparation prior to analysis. Because of these factors there is no universal system available for making elemental determinations in the life sciences. X-ray fluorescence (XRF) for measurement of elemental concentrations in biological materials has been used for many years. XRF uses a source of high-energy X-rays to irradiate a target to produce vacancies in the inner shells of the atoms which comprise the material. When these vacancies are filled, characteristic X-rays are emitted which can be detected and used for qualitative and quantitative analysis of the elemental concentration. Applications of XRF are ultimately related to the type of X-ray source used in the work. The ideal X-ray source will produce the high X-ray flux at the sample which is necessary for the best application of the method. The introduction and use of the synchrotron.

Light source (SLS) during the past twenty years has revolutionized the quality of X-ray sources by increasing the X-ray intensity several orders of magnitude compared to the highest-powered X-ray tubes. Synchrotron radiation-induced X-ray emission (SRIXE) can, therefore, be used successfully to detect very small numbers of atoms in a small spatial region. SRIXE can thus be used as an effective microprobe for applications in the life sciences. Established analytical methods have particular areas of application, but each also has important drawbacks. Atomic absorption spectroscopy (AAS) and inductively coupled plasma spectroscopy (ICPS) require relatively large samples and spatial resolution can be attained only by dissection of the specimen. Electron- and proton-induced X-ray emission require that the specimen be in a high vacuum. The spatial resolution in thick samples is limited by multiple scattering of the electron or proton beam, and sensitivity for trace elements is limited, especially for electron beams. by bremsstrahlung radiation. The SRIXE method has many advantages which complement and extend other methods and, hence, SRIXE will play an increasingly important role in the future. In this work, an outline of the underlying principles of the SRIXE will be given and applications of SRIXE to the life sciences with special reference to rare earths will be illustrated. In my forthcoming article.

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