

LIFE SCIENCES RESEARCH AT JINR, DUBNA, RUSSIA

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Within the broad spectrum of activities in the Life Sciences at JINR such as nuclear medicine and pharmacy, radiation biology, radioecology, radioisotope production – radioanalytical investigations play a special role due to the long-term experience in multi-element instrumental neutron activation analysis (INAA) at the reactor IBR-2 of FLNP, JINR.

INAA is presently being used in several projects on air pollution studies using biomonitors (moss, lichens, tree bark). The results for some selected areas of Central Russia, South Urals, and countries of Europe (Bulgaria, Poland, Romania, Bosnia and Herzegovina, Serbia and Montenegro, Macedonia, Slovakia, Western Ukraine) are reported to the European Atlas of Heavy Metal Atmospheric Deposition edited under the auspices of the Environmental Commission of the United Nations. Biomonitoring studies using NAA were initiated also in Turkey, China and South Korea. Applied to the analysis of air filters, INAA is successfully used in assessing quality of London underground air, Sahara desert impact on the Greater Cairo Area. Epithermal activation analysis in combination with atomic absorption spectrometry and energy-disperse X-ray fluorescence allowed source evaluation of metals in soil from some industrial and metropolitan areas of Russia (South Urals, Cola Peninsula) and the USA (Minneapolis). The analytical possibilities of NAA are favorably used in biotechnology, (i) for investigation of bacterial leaching of metals, including uranium and thorium from low-grade ores, rocks and industrial wastes; (ii) in the development of new pharmaceuticals based on the blue-green alga *Spirulina platensis*. Occupational health studies are carried out at several fertilizer plants in Russia, Uzbekistan, Poland, Romania, Denmark and the Netherlands in the framework of the 5th Programme COPERNICUS. The quality of foodstuffs grown in some contaminated areas of Russia is investigated in the framework of IAEA Coordinated Research Programme. In Material Sciences high-purity Al, Ge, Si, Cu and synthesis of artificial diamonds are being studied.