

INFLUENCE OF COW URINE IN THE BIOAVAILABILITY OF PLUTONIUM OXIDE PARTICLES IN PALOMARES SOILS

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ABSTRACT

The nuclear accident that occurred in Palomares in 1966 caused the release of plutonium weapon grade particles into a Mediterranean ecosystem, and consequently, urban and farming areas were contaminated with this material. Several studies focussed on the characterization and behaviour of transuranides have been carried out in the area. In this work, the solubility evolution of plutonium is analysed for a period of more than 30 years, as well as the influence that the incorporation of cow urine into organic fertilizers has on the solubility of the mentioned element. The average value of the plutonium solubility in water determined in five samples was 0.008% in 1986. However, determinations carried out in samples taken in 1999 and 2000 indicated an increase of the plutonium solubility of 22 to 96 times higher. In order to check the influence of organic fertilizers on the solubility of plutonium, a solubility test was carried out using cow urine as extracting solution. The results show that the solubility of plutonium can reach a value equal to 14%, which is similar to the one obtained with sodium pyrophosphate acting as extracting solution. Thus, these results are a clear warning of what might happen if organic fertilizers are used in transuranic-contaminated soils.