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Estudio de la distribución de plutonio en el ecosistema marino de Palomares despues de una descarga accidental de un aerosol de transuranidos. (Study on plutonium distribution in Palomares ecosystem after an accidental aerosol release of transuranic radionuclides)

(Thesis)

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A discharge of plutonium and transuranic elements accidentally occurred near Palomares (Almeria, Spain) in 1966. After decontaminating operations, about 10 g of finely dispersed plutonium remained on the soil and was spreaded on the surroundings and into Mediterranean sea. An analytical study including a 34 sampling sites of marine sediments, chemical clean-up, analytical methods for isolating plutonium from interfering radionuclides in the alfa-spectra was carried out. The detection limit level reached for the (sup 239) u+(sup 240)Pu was 10 mBq/Kg one of the lowest cited in the Spanish analytical literature until now. These results were attained following a careful electroplating Pu deposition method developed by our laboratory as result of the high signal/noise rates measured and a 20 KeV resolution. Several analytical assurance quality procedures specially developed for the Palomares ecological system were applied to the results, at the CIEMAT laboratories using reference standard certified samples. The values were unbiased and with no differences statistically significant between them. Interlaboratory comparisons were carried out. After 20 years of plutonium traces environmental transport their concentration were from two at three times the level of radionuclides in the fallout of the zone studied. The plutonium concentration range in surface sediments was 0.3-5.0 Bq/Kg. The highest values corresponding in the coastal sediments and the lowest in the deep sea. Plutonium concentrations are highly correlated with the sediments structure, grain size composition and distance from the mouth of Almanzora river. The most important contribution at the transport from the land into sea could be the freshet occurred at 1973. For this reason the plutonium ecological path has been from Palomares surroundings into the sea. (Abstract Truncated) (Atomindex citation 22:021815)

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