

Determination of Natural Radioimpurities
in p.a. Chemical Compounds of La and Lu⁺)

P.R.Adžić, A.H.Kukoč, Institute of Nuclear
Sciences "Boris Kidrič"-Vinča, Belgrade

Natural gamma spectra of $\text{La}(\text{NO}_3)_3 \cdot 6\text{H}_2\text{O}$ (25g) and Lu_2O_3 (7.449g), have been measured in order to determine natural radioactive impurities contained in the mentioned compounds.

Gamma spectra of ^{138}La ($T=1.35 \times 10^{11}\text{y}$) and ^{176}Lu ($T=(3.0 - 3.6) \times 10^{10}\text{y}$)¹⁾, have been used to construct efficiency curve around spectral lines of ^{138}La : 787.9 keV, 1435.4 keV and ^{176}Lu : 201.8 keV, 306.9 keV¹⁾. In the gamma spectra of La, ^{227}Th , ^{223}Ra and ^{211}Pb were identified. The all mentioned natural radioisotopes are in equilibrium with ^{227}Ac , the mass of which has been estimated to amount:

$$m(^{227}\text{Ac}) = (2.11 \pm 0.24) \times 10^{-11}\text{g}$$

In the similar way, in the Lu-spectra we identified dominantly ^{228}Ac -lines in equilibrium with ^{228}Ra and its mass has been estimated as:

$$m(^{228}\text{Ra}) = (3.91 - 4.66) \times 10^{-11}\text{g}$$

for two respective half-lives.

- 1) GUSEV N.G., DMITRIEV P.P., Kvantovoe izlučeniye radioaktivnih nuklidov, Moskva, Atomizdat, 1977.
BERNTHAL F.M. et. al., Phys.Rev. C3, 1294, (1971.)

+) Full account of this work will be published elsewhere