

PREPARATION OF THIN SOURCES OF ^{139}Ba BY ELECTRODEPOSITION FOR USE IN BETA-SPECTROSCOPY

J.A.G.Medeiros, C.B.Zamboni,
M.M.Hamada, A.H.Bressiane, A.L.Lapolli, Instituto de Pesquisas Energéticas e Nucleares-
CNEN-SP, São Paulo, 11049, Brasil and A.A.A.Sampaio, S.M.L.Agostinho, Instituto de
Química, Universidade de São Paulo, São Paulo, 26077, Brasil

Nuclear physics experimental studies which enables the nuclear parameters determination using β -radiation must be preceded by the development of radioactive sources. Basically, the method of preparing thin β -sources must fulfill the following requirements: the active area must be thin and uniformly distributed on the backing material, which must also be thin and of low atomic number, besides the preparation method must be reproducible, have a high transfer efficiency and low cost. Based on these requirements the electrodeposition was chosen. Using this method, the sample can be prepared as a thin layer ($<1\mu\text{g}/\text{cm}^2$) on a metallic backing ($\sim 10\mu\text{g}/\text{cm}^2$) in order to diminish the influence of the beta radiation absorption in the sample and the influence of backscattering. To apply this method is necessary to know the physical chemistry parameters associated to the radioactive material. This is carried out by potentiostatic and galvanostatic studies. An electrodeposition system and the respective procedure have been developed to determine the routine of preparation of thin samples of ^{139}Ba . The Ba-Zn active codeposits adherence and their reproducibility were checked by γ -spectroscopy using a HPGe detector and its uniformity was checked by Scanning Electron Microscopy. These analyses shown satisfactory results. Using the plastic scintillation detector, precise measurements have been performed of the end-point energy of the β - ray spectrum from ^{139}Ba .