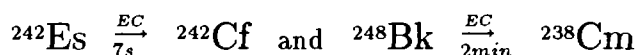


$E_{lab} < 230$ MeV were determined to be 0.5 ± 0.2 and 0.6 ± 0.3 nb respectively. The production of ^{240}Cm was attributed to the 1n-de-excitation channel of composite systems ^{249}Md and ^{245}Es . The measured ^{240}Cm production cross-sections represent upper cross-section limits for the ($HI, \alpha n$) channel of reactions under study. These limits are about 100 times lower than the cross-section values reported by Nomuraet *et al.* for the ($^{40}\text{Ar}, \alpha, xn$) channels with $x=1.2$ of $^{209}\text{Bi} + ^{40}\text{Ar}$ reaction at $E_{lab} = 208$ MeV. In this connection, we present and discuss an up-to-date summary of the available data on cross-sections of the (HI, α, xn) channels in cold-fusion-type reactions induced by projectiles ^{37}Cl to ^{50}Ti on targets of $^{203,205}\text{Tl}$, ^{208}Pb and ^{208}Bi .

Appreciable EC/β^+ - delayed fission effects were detected in the $^{209}\text{Bi} + ^{40}\text{Ar}$ and $^{209,208}\text{Pb} + ^{37}\text{Cl}$ reactions. In particular, our data reveal the occurrence of EC/β^+ - delayed fission in the decay chains



Obtaining and Preparation of Carrier-Free Cerium ^{139}Ce

R. Misiak and E. Ochab

Obtaining ^{139}Ce from lanthanum targets in a cyclotron was evaluated as a mean of preparing calibrated sources for gamma spectrometry.

A thick target yield for the formation of ^{139}Ce in the $\text{La}(d,n)^{139}\text{Ce}$ reaction was determined. The practical yield for the U-120 cyclotron at the on-target energy of 12.5 MeV is $4.6 \mu\text{Ci}/\mu\text{Ah}$.

Separation of carrier-free cerium from the target material (La_2O_3) was achieved using the extraction technique. The quadrivalent cerium was extracted with diisopropyl ether from 9M nitric acid medium with a small addition of sodium bromate. Two consecutive extractions should remove 96% of cerium from the aqueous phase. Finally, the activity is transferred quantitatively by back extraction into a dilute hydrogen peroxide solution.

During this work some problems of target preparation and separation conditions were solved. The influence of the nitric acid concentration in the range of 1-10M on cerium extraction is still to be determined.

Use of Pattern Recognition Methods in the Interpretation of Heavy Metals Content (Pb, Cd) in Children's Scalp Hair

J. Chłopicka¹, P. Zagrodzki^{1,2}, Z. Zachwieja¹, M. Krośniak¹, and M. Foltá¹

¹Department of Food Chemistry and Nutrition, Collegium Medicum, Jagellonian University, Podchorążych 1, 30-084 Cracow;

²H. Niewodniczański Institute of Nuclear Physics, Radzikowskiego 152, 31-342 Cracow.

The aim of the study was to determine the exposure to toxic metals and correlate it with possible adverse effects in children's scalp hairs from various rural and industrial areas in southern Poland. The population studied consisted of school children aged 7-12. The concentrations of Pb and Cd in children's hair were analysed by GF-AAS. The mean Pb and Cd content in the hair of the sampled individuals was found to be 4.85 ± 5.91 mg/g and 0.430 ± 0.569 mg/g respectively. The hair of boys (especially of those living in the areas of greater industrial contamination) exhibited statistically significant higher levels of Pb and Cd than the hair of girls from