USE OF 252-CALIFORNIUM AS AN ISOTOPIC SOURCE OF NEUTRONS IN CAPTURE GAMMA STUDIES

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Neutron capture gamma ray studies have been performed using 252-cf as the source of neutrons. The potential of 252-Cf as a source of neutrons in nuclear energy level studies and isotopic analysis investigations has been demonstrated through a detailed study of the neutron capture gamma ray spectrum from a sample of natural mercury, and in trace element determination through neutron activation analysis of coins and detergent-soap in Sri Lanka.

The studies on mercury enabled the identification of the isotopic ^{199}Hg, ^{196}Hg and ^{201}Hg present in natural mercury and the deduction of 28 excited levels for the nucleus ^{200}Hg. The activation analysis of coins showed the presence of Copper (^{63}Cu) and Aluminium (^{27}Al) in the coin samples. The studies on detergent - soaps indicated the presence of Sodium (^{23}Na) in nearly the same proportion in various kinds of soap samples.

The results, in general, show that 252-Cf can be used successfully as a source of neutrons in capture gamma spectroscopic work, especially with materials of high capture cross section or high abundance.

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