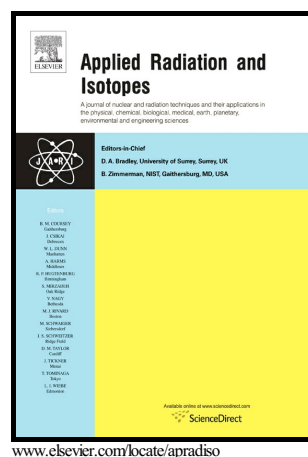


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**Measurement of formation cross-section of ^{99}Mo from the
 $^{98}\text{Mo}(n,\gamma)$ and $^{100}\text{Mo}(n,2n)$ reactions**

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ABSTRACT:

The formation cross-section of medical isotope ^{99}Mo from the $^{98}\text{Mo}(n,\gamma)$ reaction at the neutron energy of 0.025 eV and from the $^{100}\text{Mo}(n,2n)$ reaction at the neutron energies of 11.9 and 15.75 MeV have been determined by using activation and off-line γ -ray spectrometric technique. The thermal neutron energy of 0.025 eV was used from the reactor critical facility at BARC, Mumbai, whereas the average neutron energies of 11.9 and 15.75 MeV were generated using $^7\text{Li}(p,n)$ reaction in the Pelletron facility at TIFR, Mumbai. The experimentally determined cross-sections were compared with the evaluated nuclear data libraries of ENDF/B-VII.1, CENDL-3.1, JENDL-4.0 and JEFF-3.2 and are found to be in close agreement. The $^{100}\text{Mo}(n,2n)^{99}\text{Mo}$ reaction cross-sections were also calculated theoretically by using TALYS-1.8 and EMPIRE-3.2 computer codes and compared with the experimental data.

Keywords:

$^{98}\text{Mo}(n,\gamma)^{99}\text{Mo}$ reaction, $^{100}\text{Mo}(n,2n)^{99}\text{Mo}$ reaction, cross-sections, γ -ray spectrometric technique, evaluated nuclear data libraries, TALYS-1.8, EMPIRE-3.2

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