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#01-146 Measurement of $^{93}\text{Nb}(n,2n)^{92\text{m}}\text{Nb}$ reaction cross-section at different neutron energies for reactor application

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The natural niobium metal is well suited for atomic reactors due to its high temperature resistant, corrosion resistant, low long term induced radioactivity properties. Niobium alloys such as NbTi and Nb3Sn are used as super magnets in fusion reactors due to its super conducting properties. The $^{93}\text{Nb}(n,2n)^{92\text{m}}\text{Nb}$ reaction is also used as monitor reaction. Therefore accurate data of $^{93}\text{Nb}(n,2n)^{92\text{m}}\text{Nb}$ reaction cross-section needed. The cross-section of $^{93}\text{Nb}(n,2n)^{92\text{m}}\text{Nb}$ reaction was determined at the neutron energies of 16.99 ± 0.53 and 20.00 ± 0.58 MeV by using activation and off-line γ -ray spectrometric technique. The neutron beam of different energy was produced by $^7\text{Li}(p,n)^7\text{Be}$ reaction and the neutron flux was determined using the $^{27}\text{Al}(n,\alpha)^{24}\text{Na}$ monitor reaction. The measured cross-sections are compared with the theoretically calculated values based on TALYS-1.9 code and also with the evaluated and literature data.

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