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Measurement Thermal Neutron Capture Cross Section and Resonance Integral of 94Zr(n, γ)95Zr Reaction using Intense Resonance Neutron Source "IREN' '

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The thermal capture cross section and resonance intergal for the 94Zr(n,γ) reaction were measured relatively to that of 197Au(n,γ)198Au by activation method using IREN facility of the Joint Institute for Nuclear Research (JINR) [1]. Neutrons are produced via the interaction of electron beam with a tungsten target. The induced activities in activated samples were measured by a high-resolution HPGe gamma spectrometer. The necessary correction factors including neutron thermal and epithermal self-shielding effects, the γ-ray self-absorption and other were taken into account to improve the accuracy of the results [2]. Our obtained value of thermal neutron cross-section for 94Zr(n,γ)95Zr reaction is 0.0516 ± 0.00395 barn. The differences between this value and most of that listed in the international nuclear data libraries JENDL-4.0, JEFF-3.2, ENDF/B-VII.1 are less than 4%. The value of the resonance integral measured by us is 0.2764 ± 0.084 barn, which is 14% difference from the mean of previously reported data.

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