Evaluation of Neutron Nuclear Data on Cobalt-59 for JENDL-5

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Cobalt (Co) is one of the structural materials in nuclear and accelerator facilities. It is contained in carbon steel and concrete as well as SUS304. ^{59}Co is only stable isotope of Cobalt. The nuclear data of ^{59}Co are considered to be important specifically for radioactivity estimation of ^{58,60}Co related to decommissioning of the facilities. JENDL-4.0 includes the nuclear data of ^{59}Co, which based the evaluation in 1988. Major revision was carried out at the JENDL-3.3 evaluation in 2001, followed by the covariance estimation in 2002. After the release of JENDL-3.3, many measured data for capture, (n,2n), (n,p), and (n,α) reactions have been published. Therefore, the reconsideration of nuclear data is required for JENDL-5.

The evaluation of ^{59}Co was divided into three energy regions: resolved resonance region, unresolved resonance region, and fast neutron energy region. In the resolved resonance region, the resonance parameters and scattering radius were taken from de Saussure et al. (1992). In the unresolved resonance region, the data of thick sample of de Saussure et al. were adopted, supplemented with the data of thin sample for large resonances. In the fast neutron energy region, the nuclear reaction model code CCONE was used to calculate cross sections, angular distributions and double differential cross sections. The evaluation was performed based on many types of measured data. The obtained results are in good agreement with the measured data and will be shown in the poster presentation.

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