

Short Comment to Iron Data in JENDL-3.3

Chikara Konno¹, Kentaro Ochiai¹, Masayuki Wada² and Satoshi Sato¹

¹Fusion Research and Development Directorate, Japan Atomic Energy Agency

²Japan Computer System

We presented analysis results of the iron benchmark experiment at JAEA FNS with recent nuclear data libraries (JENDL-3.3, FENDL-2.1, JEFF-3.1 and ENDF/B-VII.0) and MCNP-4C at the last symposium on nuclear data. The calculation with JENDL-3.3 overestimated measured neutrons below ~ 10 keV for the iron experiment, while other calculations agreed with the measurements well. Thus we investigate what of the iron data in JENDL-3.3 causes the overestimation based on ENDF/B-VII.0.

The Sn code DORT was used for this analysis because this code gives almost the same results as MCNP quickly. Multigroup libraries for DORT with self-shielding correction were produced with the TRANSX code from MATXS files. The MATXS files supplied from JAEA Nuclear Data Center were adopted for JENDL-3.3. Since MATXS files for ENDF/B-VII.0 are not released officially, they were produced with the NJOY99.161 code and patch from BNL National Nuclear Data center for ourselves.

In order to examine which iron isotopes caused the overestimation, we calculated neutron spectra of the iron experiment with DORT, where iron isotopes in JENDL-3.3 were replaced with those in ENDF/B-VII.0 one by one. As a result, it was found out that the Fe-57 data in JENDL-3.3 caused the overestimation of measured neutrons below ~ 10 keV in the iron experiment. The elastic cross section of Fe-57 in JENDL-3.3 was different from that in ENDF/B-VII.0 largely. The Fe-57 data in JENDL-3.3 should be revised in JENDL-4.