

[P16] Theoretical Evaluation of neutron thermal scattering laws of heavy water for JENDL-5

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Thermal neutron scattering law data were calculated for the heavy water molecule toward the fifth version of the Japanese evaluated nuclear data library, JENDL-5. The scattering laws for deuterium and oxygen atoms were computed using the molecular dynamics simulation. The simulations have been performed in the temperature range from 283.6 K to 600 K. The scattering law data have been evaluated in the neutron incident energies between 0.01 meV and 10 eV. With the obtained scattering laws, we calculated neutron angle-differential and total cross sections for the heavy water molecule. We confirmed that the experimental data at room temperature were well reproduced with our scattering laws. Also, in the computed temperature range, the total cross sections were almost consistent with the ENDF/B-VIII.0 evaluations.

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