

## NEUTRON DATA EVALUATION AND VALIDATION OF RHODIUM-103

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Rhodium-103 is a prominent fission product for nuclear reactor simulations as well as an usual detector in fast neutron activation or dosimetry techniques. However, the reactions and the energy regions of interest differ significantly depending on the applications. Nevertheless, the evaluated nuclear data should cover all application needs while enforcing physics. In order to ensure its internal consistency, this new evaluation is entirely based on nuclear models.

At low energy (a few eV), the Reich-Moore approximation of the R-Matrix (SAMMY code) was applied to take into account recent GELINA transmission and radiative capture measurements relevant to thermal reactors.

In the unresolved resonance range, average parameters of the Hauser-Feshbach formalism (SAMMY / FITACS code) were adjusted onto experimental data up to the inelastic threshold.

At higher energy, the coupled-channels optical model (ECIS code) was used together with a semi-microscopic deformed potential (SMOM code) to calculate total, reaction and direct inelastic cross-sections as well as transmission coefficients. The latter were eventually employed in statistical models (TALYS code) to split the reaction into all open channels. Every calculated value was tested against differential data when available and compared with other evaluation works.

The quality of the transitions between the above three energy ranges was assessed with the help of statistical techniques to test the resolved resonance parameter distributions and the SPRT method to check optical model calculation.

The evaluated data has been transformed into the ENDF-6 format (TEFAL code), tested (ENDF utility codes) and finally processed for the end-users (NJOY code). Apart from this minimal verification procedure, the quality of the data was tested against relevant integral results for activation and thermal reactor applications. This new file will be proposed for insertion into the next release of the JEFF-3 General Purpose and Activation libraries.