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Reaction evaluation of ^{86}Kr for fusion diagnostics[1] MATTEO VORABBI, GUSTAVO NOBRE, DAVE BROWN, Brookhaven National Laboratory, AMANDA LEWIS, Naval Nuclear Laboratory, ELIZABETH RUBINO, Michigan State University — The National Ignition Facility at Lawrence Livermore National Laboratory uses ^{86}Kr as a diagnostic tool to measure the neutron flux produced by fusion reactions. As krypton is chemically inert, it can be implanted directly into the fuel capsule, and the reaction products can be measured to determine the flux of fusion neutrons. ^{86}Kr cross sections are also a valuable tool for studying both the ^{85}Kr branching point in the s-process and determining the neutron flux in stars. In this work, experimental data on the neutron production, radiative capture, inelastic scattering and total cross sections of ^{86}Kr were used in conjunction with the fast region nuclear reaction code EMPIRE and a new resonance region evaluation to produce a new evaluation of neutron-induced reactions on ^{86}Kr. We adopted a slightly deformed Koning-Delaroche optical model potential to provide a rigid-rotor coupling scheme, along with corrections to fill missing experimental information on the structure and decay of ^{86}Kr. The evaluated cross sections are in good agreement with the available experimental data.

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