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New chromium reaction evaluations[1] GUSTAVO NOBRE, Brookhaven National Laboratory, MARCO PIGNI, Oak Ridge National Laboratory, DAVID BROWN, Brookhaven National Laboratory, ROBERTO CAPOTE, International Atomic Energy Agency, ANDREJ TRKOV, Jozef Stefan Institute, RAMON ARCILLA, ARANTZAZU CUADRA , Brookhaven National Laboratory
— Chromium is very common in many nuclear applications as one of the main components in structural materials, secondary only to iron in stainless steel alloys.Re-evaluation of iron isotopes through the CIELO project, released in the ENDF/B-VIII.0 library, revealed that poor performance of steel in simulations of zero-power nuclear reactors is due to uncertainties in the previous chromium evaluations.Even though minor Cr isotopes constitute less than 17% of ^{Nat}Cr, there are strong capture resonances in the low neutron-incident energy region driven by ^{50,53}Cr cross sections. Therefore, we present new evaluations for all stable Cr isotopes,using modern nuclear theory and the EMPIRE code framework, and new evaluations of resonance data. Monte Carlo simulations for critical assemblies using new evaluations show significant improvement in the agreement with observed values. Evaluation of fast-neutron range incorporates many inelastic data experiments for the first time, in a consistent manner between neutron and gamma cross sections.

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