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Testing the predictive power of statistical model calculations of the (a,g) reaction cross-sections for the p-process BRENDAN MURPHY, Arizona State University, Tempe, AZ, ANNA SIMON, University of Notre Dame, Notre Dame, IN — p-process nucleosynthesis is believed to be the origin of 35 stable, proton-rich nuclei called "p-nuclei", that cannot be synthesized by neutron captures. The complex p-process network includes, among others, (α, γ) reactions, whose cross-sections are not very well described by current theoretical models. Here, a collection of experimentally measured (α, γ) reactions from the KADoNiS-p database was used as a test for various models obtained from TALYS, a nuclear reaction program, and NON-SMOKER, the principal theoretical database in this field. Statistical models in this investigation required the alpha optical model potential (aOMP), the gamma strength function (gSF), and the level density model (ld) as input. Permutations of all three were used in theoretical calculations; as there exist 5 separate models for aOMP and gSF, and 6 for ld, there were 150 combinations of interest. After calculating cross-sections with these parameters, a χ^2 test was used to determine the set of permutes that was closest to the experimental data. The (α, γ) reaction of the ^{91}Zr target is presented as the example case.

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