Abstract

The data libraries for light elements, actinides and fission products of the ORIGEN-S code for depletion and transmutation calculations in the SCALE4.1 computer code system have been updated with respect to cross-section data, radioactive-decay data and fission-product yield data using JEF2.2 as the basic data source and EAF3 as an additional source. This required the fission-product library to be extended with 201 new fission-product nuclides or isomeric states. The effect of the update of different quantities involved is evaluated with a burn-up benchmark. When ORIGEN-S is used as a stand-alone code, i.e. without regular update of cross-sections of the major nuclides due to changes in the neutron spectrum during burn-up, the results show appreciable differences in actinide and fission-product densities due to the cross-section update. The effects of updates of decay data and fission-product yields are generally small, but with noticeable exceptions. The update of fission and capture reaction energies gives a small but systematic change in actinide and fission-product concentration. The new ORIGEN-S libraries have also been converted for use with the SCALE4.2 package. © 1997 Elsevier Science S.A.

1. Introduction

Present-day nuclear reactor design requires an ongoing improvement in accuracy of nuclear data. Therefore, much effort is spent to the production of up to date evaluated nuclear data libraries like ENDF/B-VI and JEF2.2. However, such basic data files are seldom used directly in reactor core calculations and the basic data are mostly pro-

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