Abstract

This report presents the results of few groups calculations for the MTR-LEU nuclear research reactor fuel elements depletion analysis until 45 000 MWD/TU, taken as the maximum fuel burn up. The WIMSD-4 cell code has been employed as calculation tool. In this study, we are interested in some actinides such as the uranium and plutonium isotopes, as well as the fission products Xe135, Sm149, Sm151, Eu155 and Gd157.
Results of calculations in five energy groups are in a good agreement with those obtained with only two energy groups which can therefore be used in all subsequent calculations. The calculation results presented in this article can be used as a microscopic data base in order to estimate the amount of radioactive sources randomly dispersed in the environment. They can also be used to monitor the fuel assemblies' inventory at the core level.

Key words: depletion, burnup, isotope, MTR-LEU nuclear research reactor, WIMSD-4.