Nuclide Compositions and Total Activity of Spent MTR-HEU Fuel Elements of the IAN-R1 Research Reactor.

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With cooperation of the International Atomic Energy Agency (IAEA) and the Department of Energy (DOE) of the United States, several calculations and tasks related to the waste disposal of spent MTR fuel enriched nominally to 93% were carried out for the conversion of the IAN-R1 Research Reactor from MTR-HEU fuel to TRIGA-LEU fuel. In order to remove the spent MTR-HEU fuel of the core and store it safetly, a program was established at the Instituto de Ciencias Nucleares y Energìas Alternativas (INEA). This program included training, acquisition of hardware and software, calculations, design and construction of a decay pool, transfer of the spent HEU fuel elements into the decay pool and his final transport to Savannah River Site in United States.

In this paper are presented data of activities calculated in Ci for each relevant radionuclide present in the spent MTR-HEU fuel elements of the IAN-R1 Research Reactor, and data of photon production rates are also presented. The calculation takes in consideration data of fission products, activation products and actinides. The results obtained in this paper were used for shielding calculations in the design of the decay pool besides the dosimetric evaluations for transfering operations of the MTR-HEU fuel elements of the IAN-R1 reactor into the decay pool.

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