

ON THE POSSIBILITY TO CHANGE THE ISOTOPIC COMPOSITION OF PLUTONIUM FROM THE SPENT MOX FUEL OF PWRs IN FAST REACTORS

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The purpose of this article is to investigate the use of fast reactors for changing the isotopic composition of Pu for a better reuse in thermal reactors. The possibility to change or adjust (the term «improve» can also be used) the isotopic composition of Pu from MOX SNF of thermal reactors is determined by the fundamental characteristic of fast reactors –their capability for nuclear breeding, and is directly related to the conversion ratio (CV). It is obvious that in order to be effective for the whole two-component nuclear power, the change in Pu isotopic composition should not cause shortage of plutonium for fast reactors themselves. Therefore, fast reactors should have a high enough CV as well as fertile blankets. The only current technology to meet these requirements is that of fast sodium cooled reactors. Single or multiple recycle of plutonium from thermal reactors in the fast reactor fuel, use of uranium-235 or special (target) assemblies with reduced plutonium content are the possible ways to achieve the purpose in BN-800. This article investigate the possibility of large-scale Pu improvement in commercial fast BN-type reactors with increased conversion ratio. The perspective of an experiment on the BN-800 reactor that would let one demonstrate this possibility in the experimental way is also discussed. Measurable parameters of the change in the isotopic composition of plutonium in BN-800 are discussed in the present report.

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