

Nassau solar power plant uranium-plutonium mixed fuel





Overview

Can plutonium be used as a nuclear reactor fuel?

The plutonium is put into oxide form, mixed with depleted uranium oxide (mainly uranium-238 with about 0.2 percent uranium-235) to make a mixed oxide fuel ("MOX fuel"). Thus, it would appear that even without breeder reactors, plutonium can be useful as a nuclear reactor fuel.

Can uranium irradiate plutonium?

In 2002, the Department of Energy (DOE) proposed irradiating the plutonium. Under this plan, it would be combined with uranium to make mixed oxide (MOX) fuel to power existing U.S. commercial nuclear reactors. Burning MOX fuel in a reactor makes it difficult to use the plutonium for any other purpose.

What is uranium 235 & plutonium?

The total amount of fissile material (uranium-235 plus fissile isotopes of plutonium) must be kept below the design level -- in the vicinity of five percent for most LWRs. The plutonium is put into oxide form, mixed with depleted uranium oxide (mainly uranium-238 with about 0.2 percent uranium-235) to make a mixed oxide fuel ("MOX fuel").

Can plutonium be used as fuel?

Further, the spent fuel rods from LWRs typically contain about 0.7 percent fissile isotopes of plutonium. This plutonium, while far less than the amount of fissile material used in the reactor, can be re-extracted for use as fuel. However, most reactors are not designed to operate on pure plutonium.



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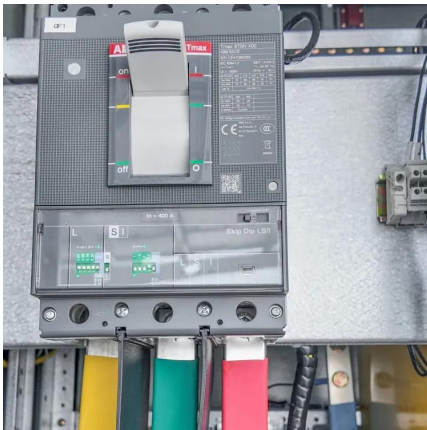
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Mixed Oxide Fuels

Mixed oxide (MOX) fuel is a blend of reprocessed uranium, plutonium, and depleted uranium, which behaves similarly to the enriched fresh uranium feed for which most nuclear reactors ...



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Recycled Lwr Uranium and Used Fuel in PHWRs
Transmutation
Notes & References
All commercial reprocessing plants use the well-proven hydrometallurgical PUREX (plutonium uranium extraction) process, which separates uranium and plutonium very



effectively. This involves dissolving the fuel elements in concentrated nitric acid. Chemical separation of uranium and plutonium is then undertaken by solvent extraction steps (neptunium See more on world-nuclear Nuclear Energy Agency (NEA)[PDF]

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