

Re: Uranium-239 Radioisotope Rockets

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On Oct 21, 8:44 pm, Willow <wrschlan...@xxxxxxxxx> wrote:

Uranium 239 has a half life of just over 20 minutes. It is routinely created with existing technology, but it has never to my knowledge been separated out within 20 minutes of being created. Instead it decays to Plutonium which can then be fissioned for energy.

I propose to build 3,000 nuclear reactors that use liquid deuterium as both a moderator and coolant similar to the kiwi rocket reactor which ran at 4 GW. It is possible for such a reactor, in principle, to create 1 kg of Uranium 239 within 20 minutes. Given 3,000 such reactors (and say each one costs just \$1 million to build and then some to operate) it is possible for around \$3 billion to create 3,000 kg of Uranium 239. I call the idea "flash-nukes" because it flashes out the Uranium-239 radioisotope.

3,000 kg of half-decayed U-239 will have a power output of over 222 GW and with nine giant turbopumps, each with 10 times the pumping capacity as the liquid hydrogen turbopumps in the space shuttle, it is possible for a 1,750,000 kg rocket to accelerate from the surface of Earth at 3 g's until it runs out of fuel. Assuming a specific impulse of just twice the space shuttle main engines, which is very reasonable, we can easily send a 10% usable payload (175,000 kg second-stage) on a trajectory towards Mars.

Using six such rockets it is possible to do a manned two-way mission to Mars with 7 people. Three are needed to land an Earth Return Vehicle and associated support equipment including a nuclear reactor and equipment to mine Mars water ice and turn it into liquid hydrogen and oxygen for propulsion for the trip back to Earth. One is a habitat with supplies for 3+ years (we use dried food, locally mined water is used). One is the crewed vehicle from Earth, and doubles as the Mars base (to be buried with dirt for radiation protection).

The sixth rocket to Mars is sent last, when the crew is ready to return. It's a Mars Return Vehicle, which the Mars Ascent Vehicle boosts up to and docks with; the crew is transferred and then the MRV returns to Earth (it's fueled up with propellant from Earth).

Re: Uranium-239 Radioisotope Rockets

Now a radioisotope rocket is NOT a crazy idea. It's real, it's been done before. It eliminates the need for a fission reactor which needs radiation shielding to shield the crew from the neutrons. It may have radioactive exhaust. A radioisotope rocket has no fissio