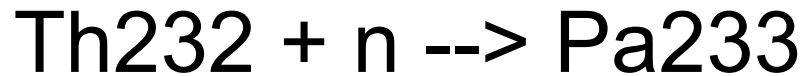
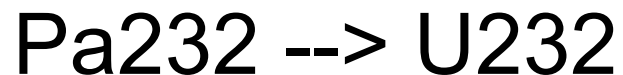
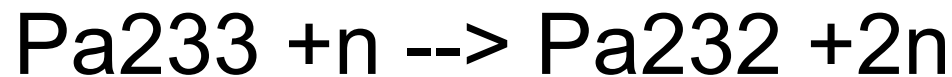


U233 Production



Pa233 half life 27 days

The Problem



Requires fast neutron

Decay Chain

- $\text{U232} \rightarrow \text{Th228} + \text{alpha}$ 68.9

Gamma 3.6 days

- $\text{Rn220} \rightarrow \text{Po216} + 0.54 \text{ Mev}$

Gamma 56 sec

- $\text{Po 216} \rightarrow \text{Pb212} +$
alpha 0.15 sec

- $\text{Pb212} \rightarrow \text{Bi212} +$
beta 10.6 hrs

- $\text{Bi212} \rightarrow \text{Tl208} +$
alpha 61 min

- $\text{Tl208} \rightarrow \text{Pb208} + 2.6 \text{ Mev}$
gamma 3 min

For Solid Fuel

- Hot cell or robotics required.

Liquid Fuel

- Handle U233 in a shielded cask.

Solutions

- In liquid fueled reactor, online chemical processing to remove Pa233 until it decays.
- Isolate Th232 from core with graphite to prevent fast neutrons