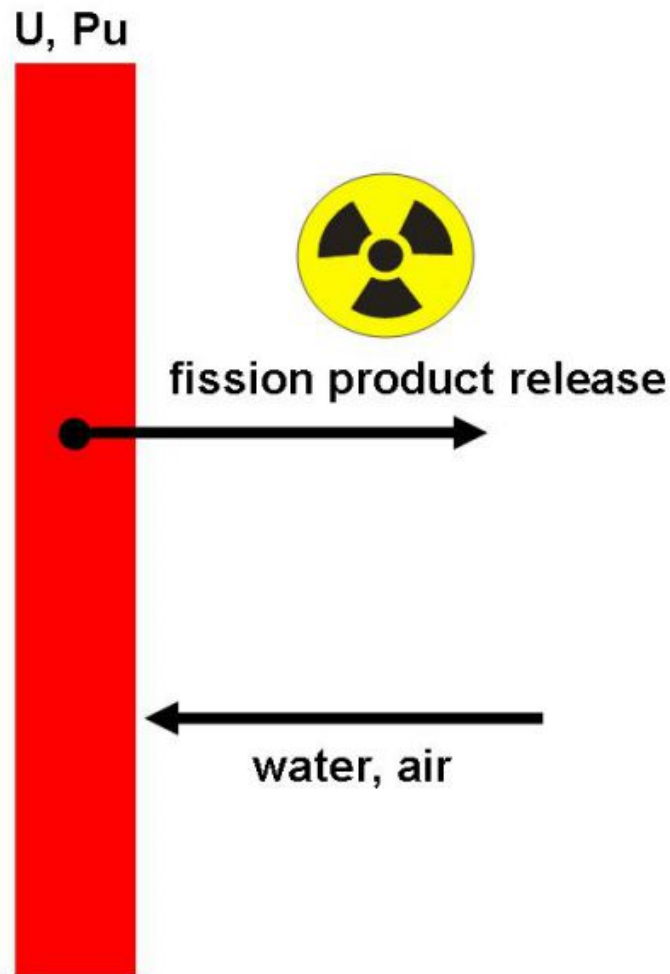
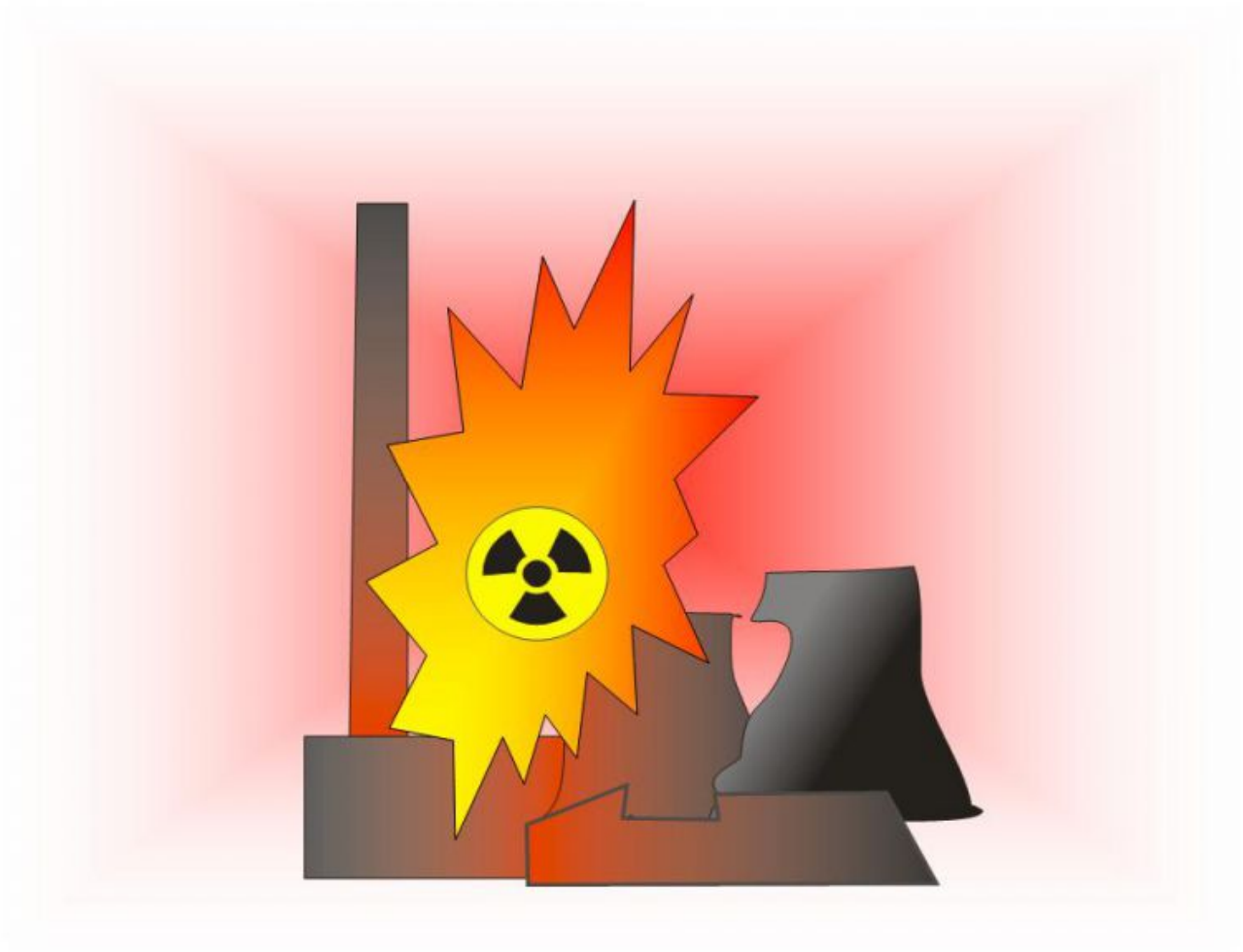


## WHAT IS THE PROBLEM WITH THE NUCLEAR FUEL?



For use in a nuclear reactor, the fissile materials (Uranium U, Plutonium Pu) must be tightly encapsulated in cladding material for the following reasons:

- During the fission process **radioactive fission products** are inevitably generated and must be prevented to leak into the reactor and the environment.
- The direct contact of hot fissile material – up to 2000 °C in the centre of the fuel rod – with coolant (e.g. water) or air has to be strictly avoided in order to prevent **chemical reactions**.



The basic problem of the nuclear fuel elements presently applied is its **metallic cladding!**

During a loss-of-coolant accident two dangerous things will happen:

- The overheated metallic fuel cladding oxidizes in water steam and generates **hydrogen** which, in most cases, explodes.
- Through the destroyed cladding, water/vapour or air have direct access to hot fuel starting further reactions with disastrous consequences.



cladded fuel

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We do propose as innovative solution for accident-tolerant fuel: **encapsulation in ceramics!**