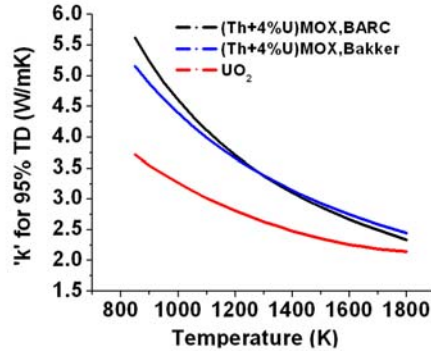


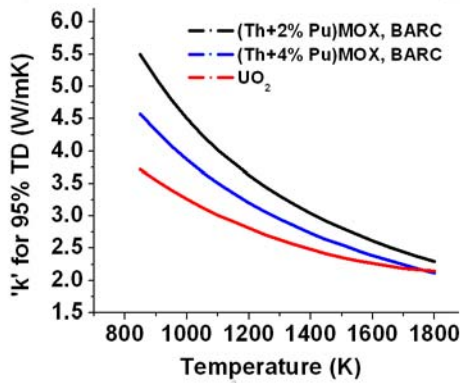
Thermophysical properties of thorium based fuels

- Higher thermal conductivity leads to lower fuel temperature
- Better dimensional stability due to lower coefficient of thermal expansion
- Relatively inert. Does not oxidise unlike UO_2 , which oxidizes easily to U_3O_8 and UO_3 . Does not react with water.
- Melting point 3500°C as against 2800°C for UO_2 .
- Fission product release rate one order of magnitude lower than that of UO_2 .

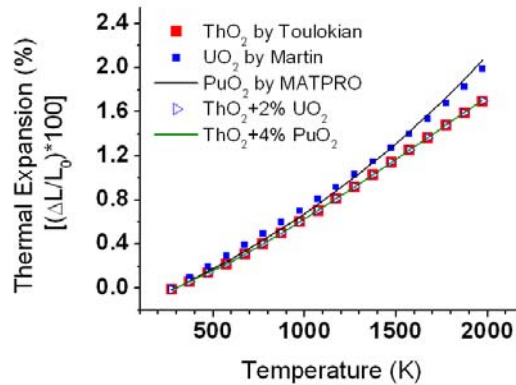
(Th-U) MOX – Thermal conductivity



(Th-Pu) MOX – Thermal conductivity



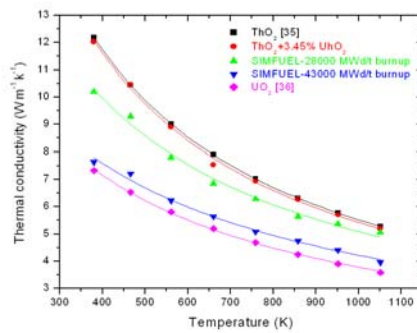
Thoria fuel – Thermal expansion



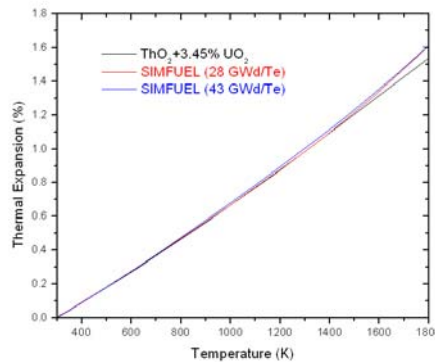
Thermophysical properties of thorium based Sim-fuels

- To evaluate the performance of the fuel under irradiation, it is important to understand the effect of fission products on thermophysical properties.
- SIMFUEL attempts to replicate the chemical state of the solid fission products so that detail experiments can be undertaken, without encountering intense radiation field, to estimate the extent of degradation in the properties of the fuel due to the presence of fission products.
- The thermophysical properties of ThO_2 -3.45% UO_2 based SIMFUEL corresponding to burn up 28,000 and 43,000 MWD/Te has been investigated from room temperature to 1473 K.

Thermal conductivity of SIMFUEL



Thermal expansion of SIMFUEL



Specific heat of SIMFUEL

