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# Joint ICTP-IAEA Workshop on Physics of Radiation Effect and its Simulation for Non-Metallic Condensed Matter | (smr 2359)

## Thursday 23 August 2012

### JRC testing facilities and experimental tools for study of radiation damage - Adriatico Guest House Giambiagi Lecture Hall (09:00-10:00)

*Most of the properties of nuclear fuels are modified during their reactor irradiation due to the numerous fissions and thermal gradient. The safe operation of nuclear fuels especially in abnormal conditions or to increased burnups to optimize their economics and environmental impact requires a thorough knowledge of their in-reactor aging.*

*The formation of radiation damage is a complex process due to the nature of the different sources like fission fragments, alpha-decaying actinides or beta-decaying fission products. Single effect studies to tackle specifically radiation damage effects from these different sources are performed using ion-implantations but also doping with radioactive elements.*

*The effect of radiation damage on the thermal-conductivity degradation of nuclear fuel could be demonstrated using UO<sub>2</sub> samples doped with <sup>238</sup>Pu.. The microstructure evolution of the nuclear fuel towards the high burnup structure could be partly explain by ion- implantation studies. Aging of waste conditioning matrices like zirconolite or pyrochlore has been accelerated by doping these ceramics with <sup>244</sup>Cm or <sup>238</sup>Pu.*

*Characterization tools like Transmission or Scanning Electron Microscopy, X-ray diffraction, thermal diffusivity or heat capacity measurement have been used on irradiated fuel samples as well as on doped or ion irradiated samples to study the elastic or inelastic energy losses and their effect in various type of ceramics.*

time	title	presenter
09:00	JRC testing facilities and experimental tools for study of radiation damage	THIERRY WISS