

# Cerium samples

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# $^{144}\text{Ce}$ samples

- Using the production line, FSUE “Mayak” PA produced  $\sim 6$  kCi of  $^{144}\text{Ce}$  last year to test the feasibility of cerium production
- From these 6 kCi, 3 samples will be delivered to CEA Saclay in March 2014
- Activity  $\mathcal{A}$  of each sample:  $50 \text{ kBq} < \mathcal{A} < 100 \text{ kBq}$
- Chemical form: solution of cerium in nitric acid at 0.1 mol/L
  - Could be transformed under solid form
  - cerium and praseodymium could be chemically separated

# HPGe measurement

- A High Purity Germanium detector has been installed this autumn in a new underground laboratory at CEA Saclay
- Start of data taking: some weeks
- Easy measurement of  $^{144}\text{Ce}$  samples
- Purity measurement (gamma emitters)
- Absolute sample activities (comparison with  $^{22}\text{Na}$  source)

# Liquid scintillator measurement

- Chemical separation of  $^{144}\text{Pr}$  through ionic chromatography
- Gamma spectroscopy to characterize the chemical separation
- Mix of Pr in liquid scintillator based on pseudocumene (PC)
- Mix placed in a cylindrical tank of diameter 5 cm, thickness 1 cm
- Tank coupled to a photomultiplier of diameter 5 cm with optical grease
- Tank also covered with a diffuser ( $\text{TiO}_2$  paint)
- Analysis will take in account scintillator non-linearity (Birks law), well known for this scintillator
- Calibration with monoenergetic source is possible
- Similar energy resolution than plastic scintillator (photo-statistic), but no retrodiffusion