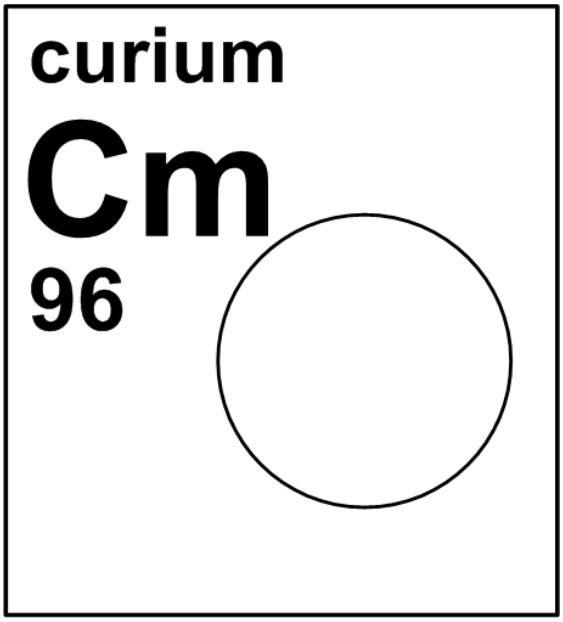
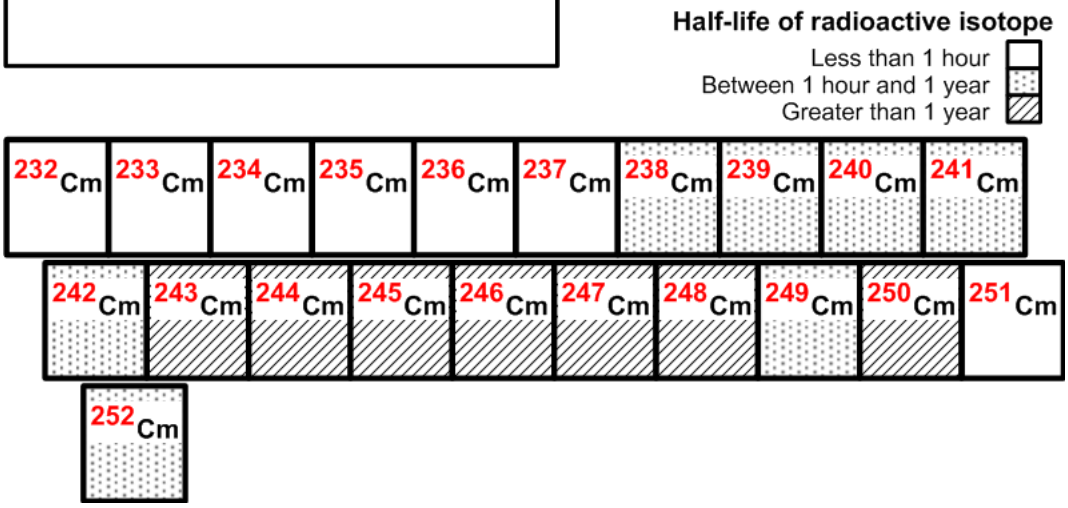
4.96 curium



Stable isotope	Relative atomic mass	Mole fraction
(none)		



Curium does not occur naturally in the Earth's crust. It was first synthesized in 1944 by Glenn T. Seaborg and his team at the University of California in Berkeley using the reaction ^{239}Pu (^{4}He, n) ^{242}Cm. The **element** was named after Pierre and Marie Curie, who discovered radium and polonium.

4.96.1 Curium isotopes in industry

^{244}Cm and ^{242}Cm (with **half-lives** of 18.1 years and 169 days, respectively) are strong alpha emitters (see **alpha decay**). The alpha emission from these **isotopes** creates a considerable quantity of heat that makes them useful as **alpha particle** sources, as well as heat generators in RTGs (radioisotopic thermoelectric generators) [72]. During a number of space missions in America and Europe, such as the Mars Exploration Rover and the Rosetta/Philae, ^{244}Cm was the source used for the alpha particle **X-ray** spectrometer that was on board [72, 615] . ^{244}Cm has a

large **neutron** capture to neutron **fission** cross-section ratio and has been used in a nuclear reactor to produce higher mass radio-isotopes of curium (Figure 4.96.1) [72, 615].

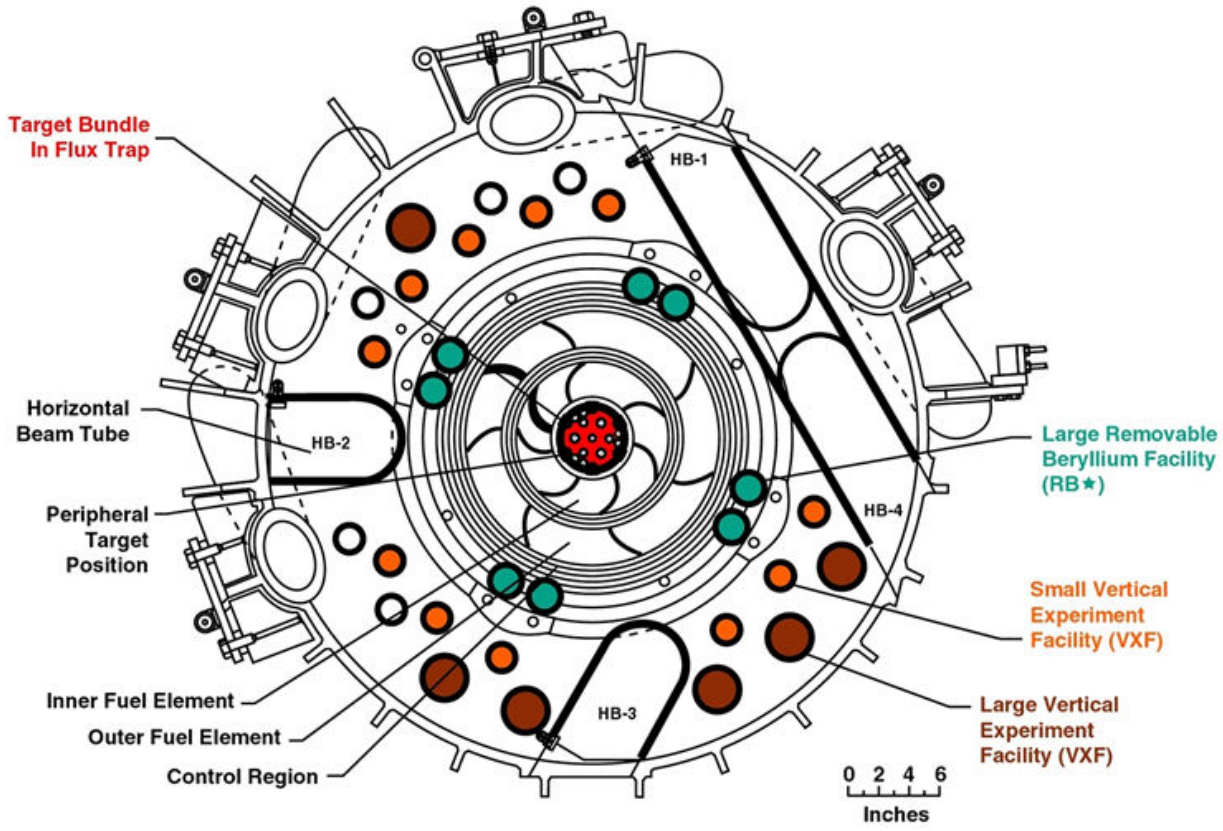


Fig. 4.96.1: Schematic drawing of the inside of a reactor core at the Oak Ridge National Laboratory's High Flux Isotope Reactor facility. ^{244}Cm is used as the target in the flux trap. (Image Source: Oak Ridge National Laboratory) [616].