

Course Description Only

A copy of the course handout may be provided upon approval from the trainer.
Please check back later.

Introduction to Plutonium Metallurgy

Instructor: Karl Staudhammer Los Alamos National Laboratory

Date/Time: Saturday, May 19, 2007 8:00 am to 5:00 pm

Class Size: 30

Materials: None Specified

Course Description: The course was compiled to provide information on the broad range of topics such as basic understanding of and the use of plutonium. The need for such a course is apparent to anyone working with plutonium since this element, more so than most other elements, requires an interdisciplinary approach to its complexity. The metallurgists must not only concern themselves with the metallurgical aspects, but also be aware of its toxicity, criticality, nuclear reactions, reactivity, flammability, chemical behavior, etc. Information on these topics and the metallurgical aspects are widely scattered in literature and is not always readily accessible.

The introduction of the course starts with the essential premise that the value of plutonium essentially resides in its nuclear properties. Plutonium is of value in weapons and nuclear reactors because neutrons of all energies induce fission in the ^{239}Pu isotopes of plutonium (Pu_{239}). However, Pu_{239} may capture neutrons to form heavier plutonium isotopes. Thus isotopes play a strong role in any plutonium system be it for energy or weapons.

This course was set up to give a conceptual view of the subject rather than defining various aspects by equations, though a few are used. Although a few equations will be presented, they are not for memorization but rather to illustrate trends. For those that are unfamiliar with the subject of metallurgy, a glossary is provided at the end of the course material.