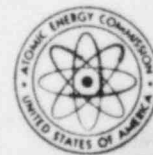


NUCLEAR TERMS

A GLOSSARY

U. S. ATOMIC ENERGY COMMISSION
Office of Information Services
A World of the Atom Series Booklet



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actinide series	The series of elements beginning with actinium, Element No. 89, and continuing through lawrencium, Element No. 103, which together occupy one position in the <i>Periodic Table</i> . The series includes uranium, Element No. 92, and all the man-made transuranic elements. The group is also referred to as the "Actinides". (Compare <i>lanthanide series</i> , <i>transuranic elements</i> .) (See Appendix.)
actinium series (sequence)	The series of nuclides resulting from the radioactive decay of uranium-235. Many man-made nuclides decay into this sequence. The end product of this sequence in nature is lead-207. (See <i>decay</i> , <i>radioactive</i> , <i>radioactive series</i> .) (See Appendix.)
activation	The process of making a material radioactive by bombardment with neutrons, protons, or other nuclear particles. Also called <i>radioactivation</i> . (See <i>activation analysis</i> , <i>induced radioactivity</i> .)
activation analysis	A method for identifying and measuring chemical elements in a sample of material. The sample is first made radioactive by bombardment with neutrons, charged particles, or gamma rays. The newly formed radioactive atoms in the sample then give off characteristic nuclear <i>radiations</i> (such as gamma rays) that tell what kinds of atoms are present and how many. Activation analysis is usually more sensitive than chemical analysis. It is used in research, industry, archeology, and criminology.
activity	<i>radioactivity</i> . (See <i>specific activity</i> .)
AEC	The U. S. Atomic Energy Commission.
aftercooling	The cooling of a reactor after it has been shut down.
afterheat	The heat produced by the continuing decay of radioactive atoms in a reactor after fission has stopped. Most of the afterheat is due to the radioactive decay of <i>fission products</i> .
air sampling	The collection and analysis of samples of air to measure its radioactivity or to detect the presence of radioactive substances. (See <i>fallout</i> .)
allobar	A form of an element differing in isotopic composition, having a different average <i>atomic weight</i> from the usually occurring form. (See <i>isotope</i> .)

neutron	[Symbol <i>n</i>] An uncharged <i>elementary particle</i> with a mass slightly greater than that of the <i>proton</i> , and found in the <i>nucleus</i> of every atom heavier than hydrogen. A free neutron is unstable and decays with a half-life of about 13 minutes into an electron, proton, and neutrino. Neutrons sustain the <i>fission chain reaction</i> in a <i>nuclear reactor</i> . (See <i>fast neutron</i> , <i>intermediate neutron</i> , and <i>thermal neutron</i> .)
neutron activation analysis	<i>Activation analysis</i> in which neutrons are the activating agent.
neutron capture	The process in which an atomic <i>nucleus</i> absorbs or captures a neutron. The probability that a given material will capture neutrons is measured by its <i>neutron capture cross section</i> , which depends on the energy of the neutrons and on the nature of the material. (See <i>capture</i> , <i>nuclear reaction</i> , <i>radiative capture</i> .)
neutron density	The number of neutrons per cubic centimeter in the core of a reactor. (See <i>flux</i> .)
neutron economy	The degree to which neutrons in a <i>reactor</i> are used for desired ends instead of being lost by leakage or nonproductive absorption. The ends may include propagation of the chain reaction, converting fertile to fissionable material, producing isotopes, or research. (See <i>leakage</i> , <i>reactivity</i> .)
neutron flux	(See <i>flux</i> .)
nondestructive testing	Testing to detect internal and concealed defects in materials using techniques that do not damage or destroy the items being tested. X rays, isotopic radiation and ultrasonics are frequently used.
normal uranium	<i>natural uranium</i> .
nuclear battery	A <i>radioisotopic generator</i> .
nuclear energy	The energy liberated by a nuclear reaction (fission or fusion) or by radioactive decay. (See <i>decay</i> , <i>radioactive</i> ; <i>fission</i> ; <i>fusion</i> ; <i>nuclear explosive</i> ; <i>nuclear reactor</i> .)
nuclear explosive	An explosive based on <i>fission</i> or <i>fusion</i> of atomic nuclei. (See <i>device</i> , <i>nuclear</i> ; <i>nuclear weapons</i> .)
nuclear fission	(See <i>fission</i> .)
nuclear fusion	(See <i>fusion</i> .)