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PRODUCTION OF RADIONUCLIDES

Naturally occurring radionuclides (e.g., uranium, thorium, radium, and radon) are heavy elements with very long half-lives (>1000 years). Their clinical role in diagnostic nuclear medicine is limited. Radionuclides commonly used clinically are produced by nuclear fission or through the bombardment of stable materials by neutrons or charged particles.

Neutron bombardment of stable materials results in fission products because of the location of the atomic chart (Fig. 1-1). Bombardment of stable materials with neutrons results in activation (i.e., conversion of stable materials by neutrons or charged particles).