

Radiometric Dating

Isotopes Frequently Used in Radiometric Dating		
Radioactive Parent	Stable Daughter Product	Half-Life Value
U-238	Pb-206	4.5 Billion Years
U-235	Pb-207	713 Million Years
Th-232	Pb-208	14.1 Billion Years
Rb-87	St-87	47 Billion Years
K-40	Ar-40	1.3 Billion Years
C-14	N-14	5730 Years

- 1) Which radioactive isotope(s) would be most useful in dating the age of the Earth?
- 2) Which radioactive isotope(s) would be most useful in dating an ancient Egyptian artifact?
- 3) What fraction of the original C-14 remains in a sample after 11,460 years?
- 4) How many half-lives have elapsed to yield a sample with 125 atoms of C-14 and 375 atoms of N-14?
- 5) How old is a sample that contains 25% of its original K-40?
- 6) How old is a sample that contains a U-235 to Pb-207 ratio of 1:7?
- 7) How old is a sample that contains 125 atoms of U-235 and 375 atoms of Pb-207?
- 8) An anthropologist claims that a specimen she uncovered is 30,000 years old. It contains a ratio of C-14 to N-14 of 1:7. Is her claim valid?
- 9) Why are radioactive isotopes useless for dating samples older than ten half-lives?