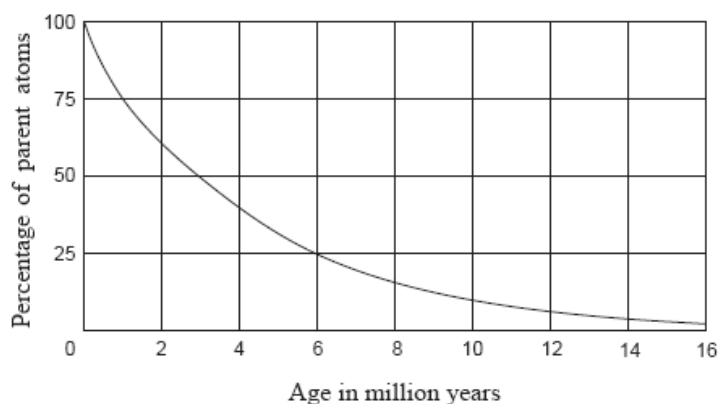


GEOLOGY 12
ABSOLUTE DATING WORKSHEET

Refer to pp 84-88 of the text as well as your notes to answer the following questions.

1. a) Define radioisotope (radioactive isotope).
b) What causes some isotopes to be unstable?
c) Explain how a carbon-14 atom decays into a nitrogen-14 atom.
d) Why won't a carbon-12 isotope decay in the same way?
2. a) Explain the term half-life.
b) Why is the half-life of a radioisotope useful in determining the age of a material?
3. Use the Figure 4.19 graph on page 86 of the text to determine the age of a sample, where:
a) 12.5% is left of the unstable parent isotope, which has a 1/2-life of 500 000 years.
b) the unstable parent isotope has a 1/2-life of 37 000 years and the daughter-parent ratio is 31:1.

4. Examine the graph to the right, representing a radioactive substance.



- a) What is the approximate 1/2-life of the substance?
 - b) About how old is a rock sample that contains about 6% of original parent material?
 - c) About how old would a different rock sample be if it contained a daughter-parent ratio of 7:1?
 - d) About how old would a third sample be if it was found to contain 75% daughter product (compared to the total amount of original parent product)?
 - e) If a rock sample originally contained 20 grams of the parent isotope, how much parent and daughter product would be found in the sample after 10 million years?
5. a) Explain why igneous rock formations such as lava flows and dikes are most useful for radiometric dating.
b) Why are sedimentary rocks not useful in radiometric dating?
 6. Examine Table 4.1 on p 87.
a) Why isn't carbon-14 dating useful in finding the age of old rocks?
b) Which dating methods would be considered useful in confirming the age of the following:
 - a 7.5 million year old lava flow
 - a 340 million year old piece of granite containing biotite and potassium feldspar
 - a piece of wood from a 12 300 year old dwelling
 7. a) What two conditions must exist for radiometric dating to be accurate?
b) What factors can alter these conditions and cause inaccuracies in the radiometric dating process?

8. For the diagram below, give an age limit for sedimentary layers X and Y, based on the radiometric ages for the igneous intrusions shown.

