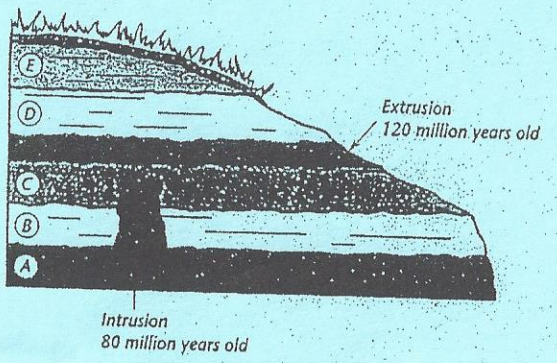
Name _____ Date _____ Class _____

Radioactive Dating

◆ Understanding Main Ideas

Use the figure below to answer the questions 1–3. Write your answers on sheet of paper.



1. Can geologists use radioactive dating to find the absolute ages of sedimentary layers A, B, C, D, and E? Explain why or why not.
2. Can geologists use radioactive dating to find the absolute ages of the extrusion or the intrusion? Explain why or why not.
3. What is the age of rock layer C? Explain how you determined its age.

◆ Building Vocabulary

Fill in the blank to complete each statement.

4. When all the atoms of a particular type of matter are the same, the matter is a(n) _____.
5. The time it takes for half of the atoms in a sample of a radioactive element to decay is called its _____.
6. All matter is made of tiny particles called _____.
7. During _____, the atoms of one element break down to form atoms of another element.

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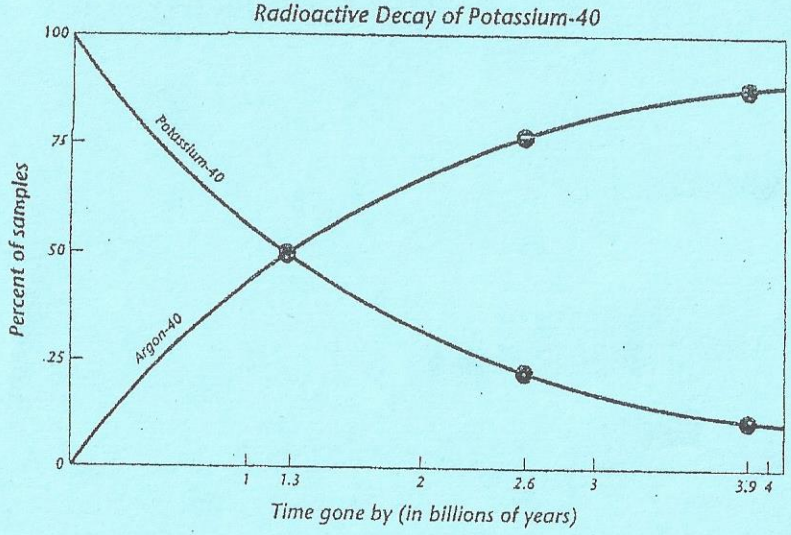
A Continuous Process

In potassium-argon dating, geologists measure the amount of radioactive potassium-40 in igneous rock and compare that amount with the amount of stable argon-40. The stable argon-40 forms as a result of the radioactive decay of the potassium-40. From this comparison, geologists can tell the absolute age of the rock. The graph below shows this radioactive decay over time.



Answer the following questions on sheet of paper.

1. When the rock first forms, what is the percentage of potassium-40 compared with the percentage of argon-40?
2. What is the half-life of potassium-40?
3. What are the percentages of the two elements at 1.3 billion years?
4. After the first half-life of potassium-40, does the rock contain more potassium-40 or argon-40?
5. What are the percentages of the two elements after three half-lives of potassium-40?
6. Does a geologist have to wait 1.3 billion years before seeing a difference in the amounts of these two elements? Explain.