

Radioactive Dating

Lesson 3

May 11-9:43 PM



What is radioactive decay?



What is radioactive dating?

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I. What is radioactive decay

A. Most elements usually do not change. But some can break down or decay over time.

- * These elements release particles and energy in a process called radioactive decay
- * These elements are radioactive
- * During radioactive decay atoms of one element break down to form atoms of another element

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B. Half-life

The rate of decay of each radioactive element never changes

- *The half-life of a radioactive element is the time it takes for half of the radioactive atoms to decay

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II. What is Radioactive Dating

A. Radioactive elements occur naturally in igneous rocks. Scientists use the rate of radioactive decay to calculate the rock's age

- * radioactive elements in igneous rocks change from one element to another element
- * so the composition of the rock changes slowly over time
- * the amount of radioactive elements decreases, but the amount of new element increases

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B. Determine Absolute Ages

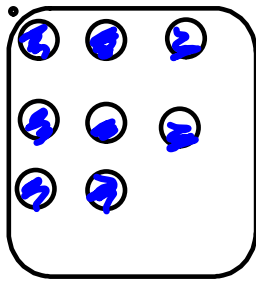
Geologists use radioactive dating to determine the absolute ages of rocks.

* In radioactive dating, scientists first determine the amount of radioactive elements in a rock. Then they compare that amount with the amount of stable elements into which the radioactive element decay

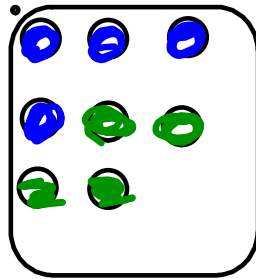
* They use this information and the half life of the element to calculate the age of the rock

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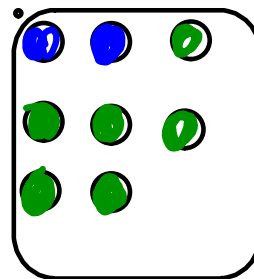
Practice



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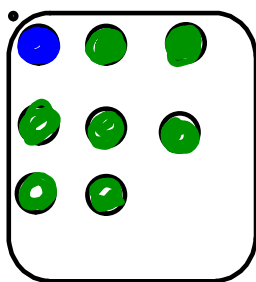


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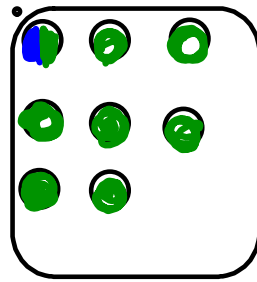


10,000

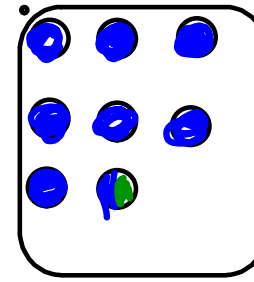
Half Life
= 5000
yrs



15,000



20,000



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C. Potassium- Argon Dating

Scientists often date rocks using potassium- 40

* This form of potassium decays into argon-40

* half-life of 1.3 billion years

* is useful for dating because of long half life

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D. Carbon-14 dating

Carbon-14 is a radioactive form of carbon

- * All plants and animals have carbon, including carbon-14
- * When an organism dies, the carbon-14 decays and changes into nitrogen-14

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To determine the age of a sample, scientists measure the amount of carbon-14 that is left in the organism

- * Carbon-14 had a half life of 5730 years
- * used to date fossils and prehistoric humans, not older than 50,000 years
- * not good for dating rocks

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