

Phase change

1. Identify each change below as a physical, chemical, or nuclear change.

For each, justify your answer.



a) During intermission at a hockey game, a zamboni sprays warm water onto the ice surface. This water freezes to form a slick new surface.

Type of change:

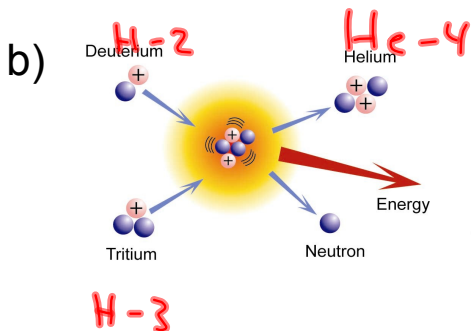
Physical



How do you know what type of change it is? No new molecules

No new substance produced OR produced.

OR The substance stays same.



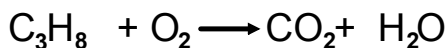
Type of change:

nuclear

How do you know what type of change it is?

New element produced

c) A Coleman stove heats up as the propane burns.



Type of change:

Chemical



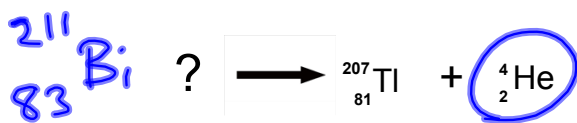
How do you know what type of change it is?

New molecules produced.

OR

New compounds produced

2. Given the following equation for a nuclear disintegration:



a) What type of radiation is emitted during this decay process?

\_\_\_\_\_ alpha particles \_\_\_\_\_

b) Name the unknown element. Explain how you got your answer.

Unknown element: Bismuth

Explanation:  $81 + 2 = 83$

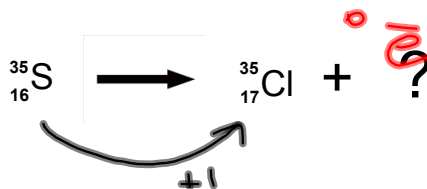
c) What is the mass number of this element? Explain your answer, based on the principle of conservation of mass.

Mass number: 211

Explanation:  $207 + 4 = 211$

Total mass product side = total mass reactant side

3. The equation for the nuclear disintegration of S-35 is the following:



a) What type of radiation is emitted during this decay process?

\_\_\_\_\_ Beta \_\_\_\_\_

b) Using the principle of conservation of mass, explain why the mass number remains unchanged.

The only thing lost is an electron which has negligible mass.

c) Explain why the atomic number increases from 16 to 17.

\_\_\_\_\_ a neutron converts into \_\_\_\_\_  
\_\_\_\_\_ a proton \_\_\_\_\_

