Fission

Name - _____

1.) What is the atomic number of the largest naturally occurring element on Earth?

2.) In your own words write a definition for nuclear fission.

3.) Uranium-238 is the most common isotope of uranium on the earth. Would a 10 kg sample of uranium-238 be dangerous?

4.) Complete the following nuclear equations:

a.) ${}^{235}_{92}U + {}^{1}_{0}n \rightarrow {}^{139}_{56}Ba + \_\_\_\_\_ + 3\,{}^{1}_{0}n$

b.) ${}^{235}_{92}U + {}^{1}_{0}n \rightarrow {}^{132}_{50}Sn + \_\_\_\_\_ + 3\,{}^{1}_{0}n$

c.) ${}^{235}_{92}U + {}^{1}_{0}n \rightarrow \_\_\_\_\_ + {}^{132}_{51}Sb + 3\,{}^{1}_{0}n$

d.) ${}^{235}_{92}U + {}^{1}_{0}n \rightarrow {}^{141}_{56}Ba + \_\_\_\_\_ + 3\,{}^{1}_{0}n$

e.) ${}^{235}_{92}U + {}^{1}_{0}n \rightarrow {}^{90}_{37}Rb + {}^{144}_{55}Cs + \_\_\_\_\_$

5.) One possible outcome of the fission reaction of uranium is the production of strontium-90 and xenon-143 along with three neutrons. Write the nuclear equation for this reaction beginning with the addition of a neutron to a uranium-235 nucleus.

6.) How does the total mass of the uranium-235 atom plus the neutron compare with the total mass of the products? Explain your answer.

7.) When an atom undergoes nuclear fission, it releases a relatively large amount of energy. Where does the energy come from?

8.) What is meant by the term "critical mass"?