**Quiz 10**

# Directions: Answer each of the following questions. Be sure to use complete sentences where appropriate. For full credit be sure to show all of your work. Where appropriate answers should be boxed for clarity, written to the correct number of significant figures, and, include the proper units.

1. The absorption of a neutron by boron-11 produces boron-12, which decays by two pathways: alpha decay and beta decay (5 points).
2. Write balanced nuclear reactions for these processes.
3. Which, if either, of nuclides produced by these decay processes is stable?

Carbon-12 is stable. It has an even number of protons and neutrons.

1. In 1999, the U.S. Environmental Protection Agency set a maximum radon level for drinking water at 4.0 pCi per milliliter (10 points).
2. How many decay events occur per second in a milliliter of water for this level of radon radioactivity?

1. If the above radioactivity were due to decay of radon-222 (t1/2 = 3.8 days), how many radon-222 atoms would there be in 1.0 mL of water?

Rate=kN

1. A 1.00 mg sample of iridium-192 was inserted into the artery of a heart patient. After 30 days, 0.756 mg remained. What is the half-life of iridium-192 (5 points)?