Examrace

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# Competitive Exams: Chemistry MCQs (Practice-Test 24 of 31)

1. Which of the following nuclides is used medicinally to treat hyperthyroidism?

    a. uranium-238

    b. americium-241

    c. carbon-14

    d. iodine-131

    e. thorium-232

2. In lecture, the use of radiation to treat food and other consumer products was discussed. Which of the following radioactive nuclides is currently being used for food irradiation?

    a. uranium-238

    b. radon-222

    c. carbon-14

    d. cobalt-60

    e. americium-241

3. Carbon-14 radioactively decays via the emission of a beta particle. Which of the following is the product nuclide of this decay?

    a. beryllium-10

    b. boron-14

    c. carbon-13

    d. carbon-14

    e. nitrogen-14

4. In fluorine-18, the neutron-to-proton ratio is too low and this nuclide undergoes radioactive decay. Which of the following decay processes would be expected to produce a nuclide with a neutron-to-proton ratio GREATER THAN that for fluorine-18?

    a. alpha decay

b. beta decay

c. gamma decay (only)

d. positron decay

e. None of these.

5. Thorium-232 decays in a series of steps to produce the unstable nuclide, radon-220. Which of the following series of decays would produce radon-220 from thorium-232?

a. 3 alpha + 2 beta

b. 4 alpha + 2 beta

c. 5 alpha + 2 beta

d. 2 alpha + 3 beta

e. 1 alpha + 2 beta

6. The radioactive nuclide, radon-222, is a problem in the basements of many homes. Calculate how long (in days) it would take for a 3.65 g sample of radon-222 to decay to 1.34 g? Radon-222 decays by a first-order process with a half-life of 3.82 days.

7. An archeologist unearths a bone sample and wants to know the age of the bone. Her chemist friend determines that 45.3% of the initial amount of carbon-14 is present in the bone sample. If the half-life of carbon-14 is 5730 years, calculate the age (in years) of the bone.

8. The following are produced by radioactive decay processes. Which one has the GREATEST mass?

a. alpha particle

b. beta particle

c. gamma ray

d. neutron

e. positron

9. In lecture, you observed an instrument gauge from a World War II vintage aircraft which had been painted with a radioactive element. Which of the following elements was used in the paint?

a. uranium

b. plutonium

c. radium

d. polonium

e. neptunium

10. Naturally occurring uranium-238 decays in a series of steps to produce the stable nuclide, lead-206. Which of the following series of decays would produce lead-206 from uranium-238?

    a. 3 alpha + 4 beta

    b. 4 alpha + 3 beta

    c. 5 alpha + 2 beta

    d. 2 alpha + 5 beta

    e. 8 alpha + 6 beta

11. One of the factors that determines how effective a particular type of radiation will be in causing biological damage is the mass of the particle. Which of the following has the GREATEST mass?

    a. alpha particle

    b. beta particle

    c. positron

    d. gamma ray

    e. neutron

12. In this reaction?

    a. alpha particle

    b. beta particle

    c. positron

    d. neutron

    e. gamma ray