Name: _____ **Class:** _____ **Date:** _____ **ID: A**

Chemistry - Spring Semester Exam Review Ch. 21

This is your Final Exam Review For Ch 21.

It was posted electronically on Thursday, May 12, 2016. Your semester exam either 5/26-5/27 (periods 1-4) or 5/31-6/1 (Periods 5-9). You should take the time (both in class and at home) to work through these problems. Your chemistry teachers will select the questions for the final exam directly from this packet. You will be provided with a formula chart.

NO CHEAT SHEETS ON THE SEMESTER EXAM.

____ 119. The half-life of carbon is 5715 years. How many milligrams of carbon-14 remain after 11430 years if you start with 100 mg?

a. 50 mg
b. 12.5 mg
c. 25 mg
d. 6.25 mg

____ 120. A species contains 15 protons, 17 electrons and 15 neutrons. Which statement is true about this substance?

a. It is an ion with -2 charge and a mass of 30 amu.
b. It is an atom with no charge and a mass of 32 amu.
c. It is an ion with +2 charge and a mass of 30 amu.
d. It is an atom with no charge and a mass of 30 amu.

____ 121. Complete and balance the following equation. The missing term is ____.

$^{85}_{36}\text{Kr} \rightarrow$ ____ + $^{0}_{-1}\beta$

a. $^{84}_{36}\text{Kr}$
b. $^{85}_{37}\text{Rb}$
c. $^{85}_{35}\text{Br}$
d. $^{85}_{35}\text{Kr}$

____ 122. Balance the following equation:

$^{9}_{4}\text{Be} + {}^{4}_{2}\text{He} \rightarrow {}^{12}_{6}\text{C} +$ _____

a. $^{4}_{2}\text{He}$
b. $^{1}_{1}\text{H}$
c. $^{0}_{-1}e$
d. $^{1}_{0}n$

____ 123. Which of the following particles has the same mass as an electron but a positive charge and is sometimes emitted from the nucleus during radioactive decay?

a. beta particle
b. alpha particle
c. positron
d. gamma ray

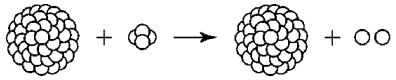
____ 124. Which of the following lists ranks nuclear radiation from most massive to least massive?
a. alpha, beta, and gamma
b. gamma, alpha, and beta
c. gamma, beta, and alpha
d. beta, gamma, and alpha

____ 125. Beta particles are
a. electrons.
b. helium nuclei.
c. electromagnetic waves.
d. neutrons.

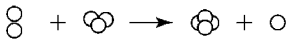
____ 126. Alpha particles are
a. neutrons.
b. helium nuclei.
c. electrons.
d. electromagnetic waves.

____ 127. Which of the following is the correct relationship between mass and energy?
a. $E = mc^2$
b. $E = mc$
c. $E^2 = mc$
d. $E = m^2c$

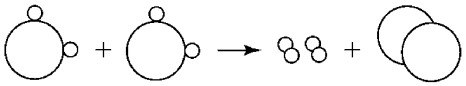
____ 128. What does the 218 in polonium-218 represent?
a. the atomic number
b. the neutron number
c. the mass defect
d. the mass number



A. $^{241}_{95}\text{Am}$ $^{4}_{2}\text{He}$ $^{243}_{97}\text{Bk}$ $2n$



B. $^{2}_{1}\text{H}$ $^{3}_{1}\text{H}$ $^{4}_{2}\text{He}$ n



C. $2H_2O$ $2H_2$ O_2

D. $^{235}_{92}\text{U}$ n $^{141}_{56}\text{Ba}$ $^{92}_{36}\text{Kr}$ $3n$

____ 129. Which of the illustrations above represents a fission reaction?
a. A
b. B
c. C
d. D

____ 130. Which of the following forms of radiation has the greatest penetrating power?
a. positrons
b. beta particles
c. alpha particles
d. gamma rays

____ 131. Complete and balance the following equation. The missing term is ____.

$^{92}_{37}\text{Rb} \rightarrow \text{____} + {}^{0}_{-1}\beta$

a. $^{92}_{38}\text{Sr}$ b. $^{92}_{36}\text{Kr}$ c. $^{91}_{36}\text{K}$ d. $^{92}_{38}\text{U}$

____ 132. Balance the following equation: $^{239}_{93}\text{Np} \rightarrow \text{____} + {}^{0}_{-1}e$

a. $^{239}_{90}\text{Th}$ b. $^{239}_{92}\text{U}$ c. $^{239}_{94}\text{Pu}$ d. $^{238}_{94}\text{Pu}$

____ 133. Whach material is the fuel for the fission process used in nuclear reactors to produce power?

a. carbon b. hydrogen c. uranium d. helium

____ 134. The spontaneous disintegration of a nucleus into a slightly lighter and more stable nucleus, accompanied by emission of particles, electromagnetic radiation, or both, is

a. nuclear fission. c. nuclear fusion.
b. radioactive decay. d. nuclear radiation.

____ 135. Reactions that affect the nucleus of an atom are called

a. fusions. c. radioactive decays.
b. fissions. d. nuclear reactions.

____ 136. Balance the following equation:

$^{238}_{92}\text{U} + \text{_____} \rightarrow {}^{239}_{92}\text{U}$

a. a neutron c. hydrogen-1
b. an alpha particle d. a beta particle

____ 137. Radioactive materials have unstable

a. electrons. c. nuclei.
b. protons. d. neutrons.

____ 138. Which of the following nuclear equations is correctly balanced?

a. $\frac{37}{18}\text{Ar} + \frac{0}{-1}e \rightarrow \frac{37}{17}\text{Cl}$

b. $\frac{6}{3}\text{Li} + 2\frac{1}{0}n \rightarrow \frac{4}{2}\text{He} + \frac{3}{1}\text{H}$

c. $\frac{254}{99}\text{Es} + \frac{4}{2}\text{He} \rightarrow \frac{258}{101}\text{Md} + 2\frac{1}{0}n$

d. $\frac{14}{7}\text{N} + \frac{4}{2}\text{He} \rightarrow \frac{17}{8}\text{O} + \frac{2}{1}\text{H}$

____ 139. Gamma rays are

a. electrons. c. electromagnetic waves.
b. helium nuclei. d. neutrons.

____ 140. How many half-lives are required for three-fourths of the nuclei of one isotope in a sample to decay?

a. $\frac{3}{4}$ c. 2
b. $\frac{3}{2}$ d. 3

____ 141. The half-life of cobalt-60 is 10.47 min.. How many milligrams of cobalt-60 remain after 41.88 min. if you start with 100 mg?

a. 3.13 mg
c. 6.25 mg
b. 12.5 mg
d. 25 mg

____ 142. The half-life of C-14 is 5,715 years. A 400 g sample of carbon has 12.5 grams remaining. How many half-lives passed for this amount to remain?

a. 3
c. 5
b. 4
d. 6

____ 143. Complete and balance the following equation. The missing term is ____.

$^{78}_{32}\text{Ge} \rightarrow \text{____} + {}^{0}_{-1}\beta$

a. $^{78}_{33}\text{Pt}$
b. $^{79}_{33}\text{As}$
c. $^{80}_{31}\text{Ga}$
d. $^{78}_{33}\text{As}$