



Chemistry

Name: _____

Section _____ TRANSMUTATION WS Date: _____

Directions (1-9): For each statement or question, choose the word or expression that, of those given, best completes the statement or answers the question.

- 1 Atoms of I-131 spontaneously decay when the
- (1) stable nuclei emit alpha particles
 - (2) stable nuclei emit beta particles
 - (3) unstable nuclei emit alpha particles
 - (4) unstable nuclei emit beta particles
- 2 Which balanced equation represents a fusion reaction?
- (1) ${}^{235}_{92}\text{U} + {}^1_0\text{n} \rightarrow {}^{93}_{36}\text{Kr} + {}^{140}_{56}\text{Ba} + 3 {}^1_0\text{n}$
 - (2) ${}^2_1\text{H} + {}^3_1\text{H} \rightarrow {}^4_2\text{He} + {}^1_0\text{n}$
 - (3) ${}^{14}_7\text{N} + {}^4_2\text{He} \rightarrow {}^{17}_8\text{O} + {}^1_1\text{H}$
 - (4) ${}^{226}_{88}\text{Ra} \rightarrow {}^{222}_{86}\text{Rn} + {}^4_2\text{He}$
- 3 Which radioisotope has an atom that emits a particle with a mass number of 0 and a charge of +1?
- (1) ${}^3\text{H}$
 - (2) ${}^{16}\text{N}$
 - (3) ${}^{19}\text{Ne}$
 - (4) ${}^{239}\text{Pu}$
- 4 Which list of radioisotopes contains an alpha emitter, a beta emitter, and a positron emitter?
- (1) C-14, N-16, P-32
 - (2) Cs-137, Fr-220, Tc-99
 - (3) Kr-85, Ne-19, Rn-222
 - (4) Pu-239, Th-232, U-238
- 5 In which type of reaction is an atom of one element converted to an atom of a different element?
- (1) decomposition
 - (2) neutralization
 - (3) saponification
 - (4) transmutation
- 6 A change in the nucleus of an atom that converts the atom from one element to another element is called
- (1) combustion
 - (2) neutralization
 - (3) polymerization
 - (4) transmutation
- 7 Given the balanced equation representing a nuclear reaction:
- $${}^{235}_{92}\text{U} + {}^1_0\text{n} \rightarrow {}^{93}_{36}\text{Kr} + {}^{140}_{56}\text{Ba} + 3X + \text{energy}$$
- Which particle is represented by X?
- (1) ${}^0_{-1}\text{e}$
 - (2) ${}^1_1\text{H}$
 - (3) ${}^4_2\text{He}$
 - (4) ${}^1_0\text{n}$
- 8 Given the nuclear reaction:
- $${}^{253}_{99}\text{Es} + X \rightarrow {}^1_0\text{n} + {}^{256}_{101}\text{Md}$$
- Which particle is represented by X?
- (1) ${}^0_{-1}\text{e}$
 - (2) ${}^0_{+1}\text{e}$
 - (3) ${}^4_2\text{He}$
 - (4) ${}^1_0\text{n}$
- 9 Which nuclear equation represents a natural transmutation?
- (1) ${}^9_4\text{Be} + {}^1_1\text{H} \rightarrow {}^6_3\text{Li} + {}^4_2\text{He}$
 - (2) ${}^{27}_{13}\text{Be} + {}^4_2\text{He} \rightarrow {}^{30}_{15}\text{P} + {}^1_0\text{n}$
 - (3) ${}^{14}_7\text{N} + {}^4_2\text{He} \rightarrow {}^{17}_8\text{O} + {}^1_1\text{H}$
 - (4) ${}^{235}_{92}\text{U} \rightarrow {}^{231}_{90}\text{Th} + {}^4_2\text{He}$

