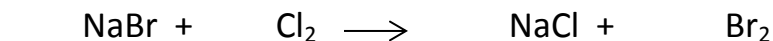# Chemistry Test 4 Review HSPS 2016 2017

**Name:**_____

SPS2e. Apply the Law of Conservation of Matter by balancing the following types of chemical equation – synthesis, decomposition, single replacement, double replacement.

1. Which coefficients go in the blanks (in order left to right) for the following chemical equation?

   ____$NaBr$ + ____Cl_2 $\longrightarrow$ ____ $NaCl$ + _____ Br_2

   A. 1,1,1,1
   B. 1,2,1,2
   C. 2,1,2,1
   D. 1,2,2,2

2. Which of the following chemical equations is balanced?

   A. $2NH_4NO_3 \longrightarrow 1N_2 + 1O_2 + 4H_2O$
   B. $1Au_2S_3 + 6H_2 \longrightarrow 2Au + 3H_2S$
   C. $4(NH_4)_3PO_4 + 3Pb(NO_3)_4 \longrightarrow 1Pb_3(PO_4)_4 + 12NH_4NO_3$
   D. $2Al + 3O_2 \longrightarrow 2Al_2O_3$

3. How many total Hydrogen atoms participate in the following equation when it is balanced?

   _____H_3PO_4 + _____HCl $\longrightarrow$ ____ PCl_5 + ____H_2O
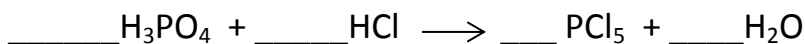
   A. 4
   B. 6
   C. 8
   D. 12

SPS3a. Students will differentiate among alpha and beta particles and gamma radiation.

4. How would one protect themselves from the dangers of gamma radiation?
   A. Gamma is weak and can be blocked by something as thin as a shirt.
   B. Gamma is moderately strong and needs to be blocked by a layer of foil (tin foil, aluminum foil, etc.)
   C. Gamma is very strong and needs layers of concrete and/or steel to stop it.
   D. Gamma is so weak that there is no real need for protection from it.

5. What is the type of decay when an atom releases an electron?
   A. Alpha
   B. Beta
   C. Gamma
   D. Sigma

6. What element does Thorium – 230 produce when it undergoes alpha decay?
   A. Uranium – 234
   B. Uranium – 226
   C. Radium – 234
   D. Radium – 226

SPS3c. Students will explain the process half-life as related to radioactive decay.

7. The half-life of iodine-125 is 60 days. How much of a 144 gram sample will remain after 360 days (about one year)?
   A. 24g
   B. 6g
   C. 4.5g
   D. 2.25g

8. A scientist has 64g of Element X. The scientist places the sample on a shelf and forgets about it. After 12 years a student finds the sample but only 2g remains. What is the half-life of Element X?
   A. 5 years
   B. 2.4 years
   C. 32 years
   D. 60 years

9. Selenium - 83 has a half-life of 25.0 minutes. How many minutes would it take a 10.0 mg sample to decay and only have 1.25 mg of the sample remaining?
   A. 3 minutes
   B. 8 minutes
   C. 50 minutes
   D. 75 minutes

SPS5c. Relate temperature, pressure and volume of gases to behavior of gases.

10. A gas occupies 12.3 liters at a pressure of 40.0 mm Hg. What is the volume when the pressure is increased to 60.0 mm Hg?
    A. 8.2 liters
    B. 18.5 liters
    C. 195.1 liters
    D. 492 liters

11. A gas occupies 900.0 mL at a temperature of 27.0 °C. What is the volume at 132.0 °C?
    A. 184.1 mL
    B. 400 mL
    C. 666.7 mL
    D. 1215 mL

12. A gas occupies 1.56 L at 1.00 atm. What will be the volume of this gas if the pressure becomes 3.00 atm?

A. 0.33 L

B. 0.52 L

C. 1.92 L

D. 4.68 L

13. What change in volume results if 60.0 mL of gas is cooled from 306 K to 278 K?

A. 9.7 mL

B. 54.5 mL

C. 66.0 mL

D. 1417.8 m

SPS6. Students will investigate the properties of solutions.

a. Describe solutions in terms of

- **solute/solvent**

- **conductivity**

- **concentration**

b. Observe factors affecting the rate a solute dissolves in a specific solvent.

c. Demonstrate that solubility is related to temperature by constructing a solubility curve.

14. In a solution of saltwater, which is the solvent and which is the solute?

A. The salt is the solvent while the water is the solute.

B. The salt is the solute and the water is the solvent.

15. Which will dissolve the fastest in water?
    A. A big, rock candy mountain
    B. Rock candy on a stick.
    C. A packet of sugar.
    D. Powdered sugar.

Use the graph below to answer questions 16 & 17.
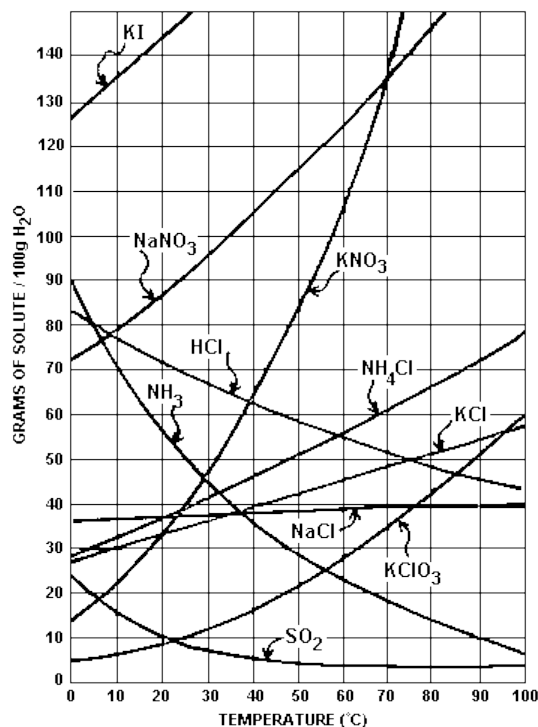
16. Which of the following is most soluble at 60 °C?
    A. KNO_3
    B. $NaNO_3$
    C. SO_2
    D. NH_4Cl

17. At which temperature is NH_3 most soluble?
    A. 20 °C
    B. 40 °C
    C. 60 °C
    D. 80 °C

SPS2b. Predict formulas for stable binary ionic compounds based on balance of charges.

18. What is the formula for the compound formed when Ca combines with Br?
    A. Ca_2Br
    B. $CaBr$
    C. $CaBr_2$
    D. $Ca_{+2}Br_{-1}$

19. What is the formula for the compound formed when Silver (I) combines with Phosphorous?
    A. $Ag(I)P$
    B. AgP_3
    C. Ag_3P
    D. $Ag^{+1}P^{-3}$

20. What is the compound formed when Hydrogen combines with Sulfur?
    A. HS
    B. H_2S
    C. HS_2
    D. H_2S_2

SPS2c. Use IUPAC nomenclature for transition between chemical names and chemical formulas of

- **binary ionic compounds (containing representative elements).**
- **binary covalent compounds (i.e. carbon dioxide, carbon tetrachloride).**

21. What is the chemical formula for tetranitrogen pentahydride?
    A. N_4H_5
    B. N_5H_4
    C. $4N5H$
    D. NH_4

22. What is the chemical formula for Vanadium (V) oxide?
   A. V_5O_2
   B. VO_5
   C. V_5O
   D. V_2O_5

23. What is the chemical name for the compound with the formula NH_4NO_3?
   A. Nitrogen Hydrogen Nitrate
   B. MonoNitrogen TetraHydrogen Mononitrogen Trioxide
   C. Ammonium Nitrate
   D. Dinitrogen tetrahydrogen trioxide

24. What is the chemical name for the compound with the formula P_5F_8?
   A. Pentaphosphorous octafluoride
   B. Phosphorous (VIII) fluoride
   C. Phosphorous fluoride
   D. Octaphosphorous pentafluoride

25. What is the chemical name for the compound with the formula TiO_2?
   A. Titanium oxide
   B. Titanium dioxide
   C. Titanium (II) oxide
   D. Titanium (IV) oxide

Answers

1. C
2. C
3. C
4. C
5. B
6. D
7. D
8. B
9. D
10. A
11. D
12. B
13. B
14. B
15. D
16. B
17. A
18. C
19. C
20. B
21. A
22. D
23. C
24. A
25. D