

SHOW WORK!!

2 1.

Which of the following equations is (are) balanced?

1. $\text{NaCl} + \text{Pb}(\text{NO}_3)_2 \longrightarrow \text{PbCl}_2 + \text{NaNO}_3$
2. $(\text{NH}_4)_2\text{Cr}_2\text{O}_7 \longrightarrow \text{N}_2 + 4\text{H}_2\text{O} + \text{Cr}_2\text{O}_3$
3. $\text{Fe}_3\text{O}_4 + 3\text{CO} \longrightarrow 3\text{Fe} + 3\text{CO}_2$

2.

The formulas of the hydroxide ion, the nitrate ion, and the phosphate ion are represented, respectively, as



3. The chemical name for MgI_2 is magnesium iodide and for $\text{Cr}(\text{NO}_2)_2$ is chromium (II) nitrite

4. The chemical formula for iron (III) sulfide is Fe_2S_3 and for calcium perchlorate is $\text{Ca}(\text{ClO}_4)_2$

5.

What is the molar mass of ammonium sulfate, $(\text{NH}_4)_2\text{SO}_4$, an important synthetic fertilizer?

(Help: from periodic table use atomic masses: nitrogen 14. a.m.u. , hydrogen 1.0 , sulfur 32, oxygen 16.)

Show calculation:

$$14 \times 2 + 1 \times 8 + 32 + 16 \times 4 = 28 + 8 + 32 + 64 = 132 \text{ g/mol}$$

6. Write an equation of combustion of pentane C_5H_{12} with oxygen to give carbon dioxide and water. Balance it.



C 7. The **STRONGEST** intermolecular forces between molecules of PH_3 are

- a. ionic bonds. b. hydrogen bonds. c. dipole–dipole attractions. d. London forces.

EXPLAIN: PH_3 is shaped as trigonal pyramid , polar – so dipole-dipole interaction is present.

The following categories are to be used for Questions 8 through 11. Each response may be used once, more than once, or not at all. **EXPLAIN your choice briefly in each case** (using Lewis structure or molecular geometry if needed).

- a. polar molecular gas; b. nonpolar molecular gas c. covalent network solid
d. ionic solid e. metallic solid

8. CO_2 , carbon dioxide *b. non-polar linear molecule

9. SiH_4 , silane *b. non-polar tetrahedral molecule

10. CaH_2 , calcium hydride *d. metal + non metal \rightarrow ionic

11. SO_3 , sulfur trioxide *b. trig planar , non polar molecule

- C 12. A solid has a very high melting point, is hard, and in the molten state it is a non-conductor. The solid is
- a. a molecular solid.
 - b. a metallic solid.
 - *c. a covalent network solid.
 - d. an ionic solid.
 - e. an amorphous solid.

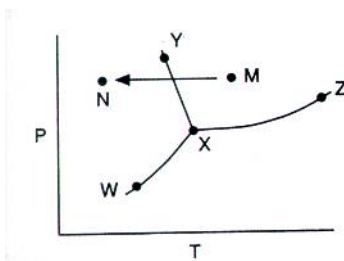
Give example of such solid: **Diamond, C**

13. Which of the following compounds would be expected to have the **HIGHEST** boiling point?

- *a. CaF_2 b. KF c. CsF d. H_2O
- ionic, charge +2, -1 ionic, charge +1, -1 ionic, +1, -1, large radius on Cs molecular polar, H bonds
- e. CF_4 molecular non-polar

EXPLAIN:

- D 14. From a consideration of the phase diagram below, a change from point M to point N corresponds to



- a. sublimation.
- b. condensation.
- c. evaporation.
- *d. freezing.
- e. liquefaction.

Give an example of such transformation for specific substance: **water to ice**

YOUR Name: _____ KEY _____

Grader _____

Points lost _____