

# CH 121

## General and Inorganic Chemistry Exam 4 June 20, 2002

Name: \_\_\_\_\_  
(please print)

SSN: \* \* \* - \* \* - \_\_\_\_\_  
(last 4 digits)

Each question is worth 1 point.

Circle your answer clearly, otherwise no credit will be given.

Circle only one answer. If you circle two or more, you will receive no credit.

1. Which of the following formulas represents an alkane?

c.  $C_4H_{10}$

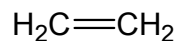
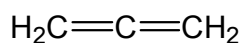
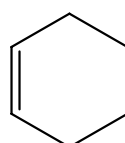
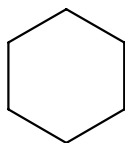
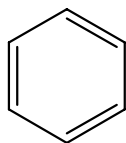
2. The chemical formula of acetylene is

b.  $C_2H_2$

3. The bond angles in propene are

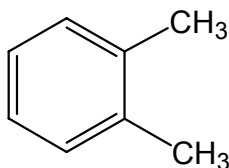
c.  $109.5^\circ$  and  $120^\circ$

4. How many of the following compounds are aromatic molecules?



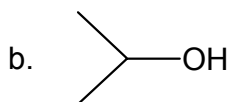
b. 1

5. The common name of the following compound is

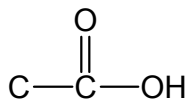


a. o-dimethylbenzene.

6. Which of the following molecules is a secondary alcohol?



7. The functional group below is characteristic of



a. acids.

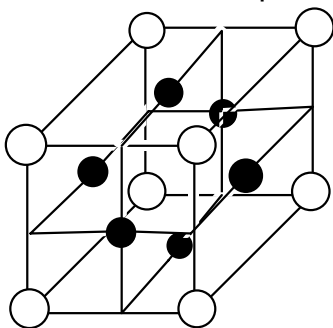
8. The number of different structural isomers of dichlorobenzene is

c. 3

9. Which of the following represents the largest gas pressure?

c. 5.0 atm

10. What are standard temperature and pressure conditions for gases?  
d. 0 °C and 760 torr
11. If 5.42 L of air measured at 735 torr and 23 °C is heated to 35 °C in the same container, what is the new pressure?  
e. 765 torr
12. When 7.00 grams of helium and 14.0 grams of argon were mixed in a flask, the pressure was measured as 712 torr. What is the partial pressure of the helium?  
a. 593 torr
13. What pressure (in atmospheres) is exerted by 82.5 grams of CH<sub>4</sub> in a 75.0 liter container at 35.0 °C?  
c. 1.73 atm
14. Which of the following gases has the greatest density at 0 °C and 1 atm?  
c. F<sub>2</sub>
15. What is the molar mass of a gas which has a density of 1.30 g/L measured at 27 °C and 0.400 atm?  
d. 80.0 g/mol
16. The empirical formula of a certain hydrocarbon is CH<sub>2</sub>. When 0.125 moles of this hydrocarbon is completely combusted with excess oxygen, it is observed that 11.2 L of H<sub>2</sub>O gas is produced at STP. What is the molecular formula of the unknown hydrocarbon?  
d. C<sub>4</sub>H<sub>8</sub>
17. The equation which represents the number of atoms in a face-centered cubic unit cell is  
e.  $8(1/8) + 6(1/2)$
18. An atom that is shared equally between eight cubic unit cells is called  
c. a corner atom.
19. The figure below represents a unit cell where copper atoms are on the faces and gold atoms are at the corners. The empirical formula of the alloy is



b. Cu<sub>3</sub>Au

The following questions pertain to gold (atomic mass 197.0 g/mol) which crystallizes in a face-centered cubic arrangement with the atoms touching along the face diagonal. A gold atom has a radius of  $1.44 \times 10^{-8}$  cm.

20. What is the density of gold in  $\text{g/cm}^3$ ?

c.  $19.4 \text{ g/cm}^3$