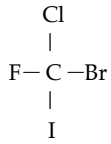
CHM 1143 Homework Set 4

TUD Department of Chemistry
Spring 2017

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) In the molecule below, which atom has the largest partial negative charge _____? 1) _____



A) Cl B) C C) I D) Br E) F

2) The ability of an atom in a molecule to attract electrons is best quantified by the _____. 2) _____
A) diamagnetism
B) first ionization potential
C) paramagnetism
D) electron change–to–mass ratio
E) electronegativity

3) Given the electronegativities below, which covalent single bond is most polar? 3) _____

Element:	H	C	N	O
Electronegativity:	2.1	2.5	3.0	3.5

A) O–N B) O–H C) O–C D) C–H E) N–H

4) The Lewis structure of AsH_3 shows _____ nonbonding electron pair(s) on As. 4) _____
A) 0
B) 1
C) 2
D) 3
E) This cannot be determined from the data given.

5) According to VSEPR theory, if there are four electron domains in the valence shell of an atom, they will be arranged in a(n) _____ geometry. 5) _____
A) octahedral
B) trigonal planar
C) linear
D) trigonal bipyramidal
E) tetrahedral

6) The molecular geometry of the SiH_2Cl_2 molecule is _____. 6) _____
A) octahedral
B) tetrahedral
C) trigonal pyramidal
D) trigonal planar
E) T–shaped

7) The molecular geometry of the $PHCl_2$ molecule is _____. 7) _____

A) trigonal planar
B) T–shaped
C) tetrahedral
D) bent
E) trigonal pyramidal

8) A sample of gas (24.2 g) initially at 4.00 atm was compressed from 8.00 L to 2.00 L at constant temperature. After the compression, the gas pressure was _____ atm. 8) _____

A) 4.00 B) 16.0 C) 2.00 D) 8.00 E) 1.00

9) A gas originally at 27 °C and 1.00 atm pressure in a 3.9 L flask is cooled at constant pressure until the temperature is 11 °C. The new volume of the gas is _____ L. 9) _____

A) 4.1 B) 0.24 C) 0.27 D) 3.9 E) 3.7

10) How many grams of H_3PO_4 are in 175 mL of a 3.5 M solution of H_3PO_4? 10) _____

A) 4.9 B) 612 C) 0.61 D) 60 E) 20

11) The concentration (M) of an aqueous methanol produced when 0.200 L of a 2.00 M solution was diluted to 0.800 L is _____. 11) _____

A) 0.800 B) 0.400 C) 8.00 D) 0.500 E) 0.200

12) A 31.5 mL aliquot of HNO_3 (aq) of unknown concentration was titrated with 0.0134 M NaOH (aq). It took 23.9 mL of the base to reach the endpoint of the titration. The concentration (M) of the acid was _____. 12) _____

A) 0.0051 B) 0.0102 C) 0.227 D) 1.02 E) 0.0204

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1) A sample of a gas (5.0 mol) at 1.0 atm is expanded at constant temperature from 10 L to 15 L. The final pressure is _____ atm. 1) _____
A) 7.5 B) 15 C) 0.67 D) 3.3 E) 1.5

2) A sample of a gas originally at 25 °C and 1.00 atm pressure in a 2.5 L container is subject to a pressure of 0.85 atm and a temperature of 15 °C. The final volume of the gas is _____ L. 2) _____
A) 2.8 B) 0.38 C) 2.6 D) 2.1 E) 3.0

3) The amount of gas that occupies 36.52 L at 68.0 °C and 672 mm Hg is _____ mol. 3) _____
A) 12.7 B) 127 C) 878 D) 24.4 E) 1.15

4) The density of ammonia gas in a 4.32 L container at 837 torr and 45.0 °C is _____ g/L. 4) _____
A) 0.194
B) 4.22×10^{-2}
C) 0.719
D) 3.86
E) 0.432

5) The molecular weight of a gas is _____ g/mol if 3.5 g of the gas occupies 2.1 L at STP. 5) _____
A) 4.6×10^{2}
B) 37
C) 41
D) 5.5×10^{3}
E) 2.7×10^{-2}

6) The volume of HCl gas required to react with excess magnesium metal to produce 6.82 L of hydrogen gas at 2.19 atm and 35.0 °C is _____ L. 6) _____
A) 4.38 B) 6.82 C) 2.19 D) 3.41 E) 13.6

7) The molecular geometry of the SF_2 molecule is _____. 7) _____
A) trigonal planar
B) bent
C) octahedral
D) tetrahedral
E) linear

8) The molecular geometry of the H_3O^+ ion is _____. 8) _____
A) trigonal pyramidal
B) tetrahedral
C) bent
D) octahedral
E) linear