

Chemistry 101 Extra Credit Project Review

- 1.1 The term that is related to the reproducibility of a measurement is:
a. accuracy b. precision c. qualitative d. quantitative
- 1.2 How many significant figures are there in the value 0.003060?
a. 7 b. 6 c. 5 d. 4
- 1.3 If the distance between two carbon atoms is 1.54×10^{-8} cm, what is this distance in pm?
a. 0.154 b. 1.54 c. 154 d. 1,5400
- 1.4 A 5.00×10^2 g sample of ethylene glycol has a density of 1.114 g/cm^3 . Calculate its volume.
a. 0.00223 mL b. 7.24 mL c. 8.98 mL d. 449 mL
- 1.5 A solution is a:
a. pure compound b. homogeneous mixture c. pure element d. pure mixture
- 2.1 The following species ${}_{34}\text{Se}^{2-}$, ${}_{36}\text{Kr}$, and ${}_{38}\text{Sr}^{2+}$, all have the same number of:
a. protons b. electrons c. neutrons d. isotopes
- 2.2 The name of the SO_4^{2-} ion is:
a. sulfide b. sulfate c. thiosulfite d. sulfite
- 2.3 The oxoanion that comes from nitric acid is:
a. NO^- b. NO_2^- c. NO_3^- d. N_2O_3
- 3.1 What is the molar mass of $(\text{NH}_4)_2\text{SO}_4$?
a. 70 g/mol b. 92 g/mol c. 114 g/mol d. 132 g/mol
- 3.2 How many Aluminum atoms are there in 25 g of Al_2S_3 ?
a. 1.0×10^{23} b. 2.0×10^{23} c. 4.5×10^{23} d. 4.0×10^{21}
- 3.3 Analysis of a hydrocarbon showed that it contained 14.4% hydrogen and 85.6% carbon by weight. What is its simplest formula?
a. CH b. CH_2 c. CH_3 d. C_2H_3
- 3.4 An organic compound composed of only C and H contains 79.88% C. What is its empirical formula?
a. C_2H b. CH c. CH_3 d. C_2H_3
- 4.1 In which of the following is the oxidation state of nitrogen given incorrectly?
a. $\text{H}_2\text{N}_2\text{O}_2$ (+1) b. N_2H_4 (-2) c. NaN_3 (-1) d. HNO_2 (+3)
- 4.2 In the following, which species is reduced?
 $3\text{Ag}_2\text{S} + 8\text{H}^+ + 2\text{NO}_3^- \rightarrow 6\text{Ag}^+ + 3\text{S} + 2\text{NO} + 4\text{H}_2\text{O}$
a. Ag_2S b. H^+ c. NO_3^- d. S

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4.3 The oxidation number of chromium in sodium chromate, NaCrO_2 , is:

- a. -2 b. -1 c. +3 d. +2

4.4 Which of the following conversions requires a reducing agent:

- a. $\text{Mn}^{3+} \rightarrow \text{Mn}^{2+}$ b. $\text{SO}_2 \rightarrow \text{SO}_3$ c. $\text{SiF}_4 \rightarrow \text{SiF}_6^{2-}$

4.5 In order to dilute 40.0 mL of 0.600 M HCl to 0.100 M, the volume of water that would need to be added would be:

- a. 80.0 mL b. 100 mL c. 160 mL d. 200 mL

5.1 A flexible vessel contains 1.5 L of gas at sea level, where the pressure is 1.0 atm. What will the volume be when the pressure is 0.85 atm, the temperature remaining constant?

- a. 1.3 L b. 1.5 L c. 1.8 L d. 2.0 L

5.2 At standard conditions, it was found that 1.00 L of a gas weighed 0.760 g. Its molecular mass is:

- a. 17.0 g/mol b. 22.4 g/mol c. 28.0 g/mol d. 30.0 g/mol

6.1 The quantity of heat needed to raise the temperature of a sample of a substance 1 °C. is the sample's:

- a. heat capacity b. specific heat c. enthalpy d. work

6.2 The H of fusion for sulfur is 17.7 kJ/mol. How many grams of sulfur can be melted by 29.0 kJ of energy?

- a. 9.8 g b. 19.5 g c. 26.2 g d. 52.5 g

7.1 What orbital has the quantum numbers $n=3, l=2, m_l=-1$?

- a. s b. p c. d d. f

8.1 The principle quantum number of the valence electrons in an atom of lead is:

- a. 2 b. 6 c. 4 d. 5

8.2 Which of the following elements has the smallest ionization energy?

- a. F b. Be c. B d. Mg

9.1 The total number of valence electrons in the acetate ion, CH_3COO^- is

- a. 22 b. 23 c. 24 d. 36

9.2 Which of the following violates the octet rule?

- a. N_2O b. XeF_4 c. NH_4 d. NO_2^-

10.1 Which of the following species has a pyramidal molecular geometry?

- a. C_2H_4 b. CH_4 c. NH_3 d. H_2CO

11.1 Which of the following has the highest boiling point?

- a. H_2O b. H_2S c. NH_3 d. H_2Se