THE FOLLOWING RESOURCE MAY NOT COVER ALL FINAL EXAM MATERIAL

43a. Convert 45 m/s to km/hr.

46a. How many moles of CH_4 are in 48.2 g of this compound?

46b. How many molecules of CH_4 are in 48.2 g of this compound?

47. The combustion of propane (C_3H_8) in the presence of excess oxygen yields CO_2 and H_2O:

$$C_3H_8\,(g) + 5\,O_2\,(g) \rightarrow 3CO_2\,(g) + 4\,H_2O\,(g)$$

a. How many mol of CO_2 are produced when 2.5 mol of O_2 are consumed in their reaction?

b. How many grams of H_2O are produced by the combustion of 4.2 mol of C_3H_8?

48. Classify the following reactions as combination, combustion, decomposition, single replacement, neutralization, precipitation:

a. $HCl\ (aq) + NaOH\ (aq) \rightarrow NaCl\ (aq) + H_2O\ (l)$ _____

b. $2\ Na\ (s) + 2\ H_2O\ (l) \rightarrow 2\ NaOH\ (aq) + H_2\ (g)$ _____

c. $CaO\ (s) + H_2O\ (l) \rightarrow Ca(OH)_2\ (s)$ _____

d. $Ba(NO_3)_2\ (aq) + K_2SO_4\ (aq) \rightarrow BaSO_4\ (s) + 2\ KNO_3\ (aq)$ _____

e. $2\ H_2O\ (l) \rightarrow 2\ H_2\ (g) + O_2\ (g)$ _____

49. A 36.3 mL aliquot of 0.0529 M H_2SO_4 (aq) is to be titrated with 0.0411 M NaOH (aq). What volume (mL) of base will it take to reach the equivalence point?

50. Write abbreviated configurations (noble gas core) for the following:

a. K _____

b. Cu _____

c. Ge _____

d. Mn^{2+} _____

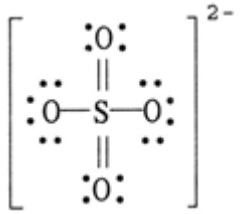
51. Draw Lewis structures for the following, showing any reasonable resonance structures where applicable:

a. NH_3

b. XeF_4

c. HCO_2^-

52. For each of the following Lewis structures, fill in the information required:

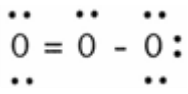
a. 

Molecular geometry _____

Formal charge on S _____

O-S-O bond angle _____

Hybridization of S _____

b. 

Molecular geometry _____

Formal charge on central O _____

O-O-O bond angle _____

Is the molecule polar or nonpolar? _____

53a. A sample of a gas (5.0 mol) at 1.0 atm is expanded at constant temperature from 10 L to 15 L. What is the final pressure of the gas in atm?

53b. What is the pressure, in atm, of a sample of CH_4 gas (6.022 g) in a 30.0 L vessel at 402 K?