**Quiz 9A**

# Directions: Answer each of the following questions. Be sure to use complete sentences where appropriate. For full credit be sure to show all of your work. Where appropriate answers should be boxed for clarity, written to the correct number of significant figures, and, include the proper units.

1. What is the name and formula of the catalyst in the Measurement of the Gas Constant and Molar Volume of Oxygen experiment (2 points)?

Manganese(IV) oxide, MnO2

1. What kind of intermolecular forces are present in the following substances (6 points)?
	1. HCl \_\_\_\_\_\_\_\_London-dispersion forces, dipole forces
	2. He \_\_\_\_\_\_\_\_London-dispersion forces
	3. NH3 \_\_\_\_\_\_\_\_London-dispersion forces, dipole forces, hydrogen bonding
2. The decomposition of a silver oxide sample forms 15.8 g of silver metal (12 points):
	1. Balance the unbalanced equation:

2 Ag2O (s) → 4 Ag (s) + O2 (g)

* 1. The oxygen gas is collected through water at an atmospheric pressure of 752 mm Hg. If the vapor pressure of water at 25 °C is 23.8 mm Hg, what is the partial pressure of dry oxygen gas?

$$P\_{atmosphere}=P\_{water}+ P\_{O\_{2}}⟹P\_{O\_{2}}=P\_{atmosphere}-P\_{water}$$

$$P\_{O\_{2}}=752 mm Hg-23.8 mm Hg=728.2 mm Hg≈728 mm Hg or 0.959 atm$$

* 1. How many moles of oxygen gas can be formed?

$$15.8 g Ag×\frac{1 mol Ag}{107.868 g Ag}×\frac{1 mol O\_{2}}{4 mol Ag}=0.03661883 mol O\_{2}≈0.0366 mol O\_{2}$$

* 1. What is the total volume of oxygen gas formed?

$$PV=nRT⟹V=\frac{nRT}{P}$$

$$V=\frac{\left(0.0366 mol\right)\left(0.08206 \frac{L atm}{mol K}\right)\left(25+273\right)K}{728 mm Hg}×\frac{760 mm Hg}{1 atm }$$

$$V=0.934577161 L ≈0.935 L$$