**Quiz 11A**

# 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 solutions are you titrating this week (3 points)?

Oxalic acid, H2C2O4 (aq)

Sodium hydroxide, NaOH (aq)

Acetic acid, HC2H3O2 (aq) (unknown)

1. Distinguish between the solute and solvent in each of the following solutions (3 points):
	1. Saltwater, NaCl (aq) NaCl solute, H2O solvent
	2. Sterling silver (92.5% Ag, 7.5% Cu) Cu solute, Ag solvent
2. A 0.0250 L solution prepared by mixing 5.881 g of iron(II) phosphate with water (8 points).
	1. What is the molarity of the solution?

$\frac{5.881 g Fe\_{3}(PO\_{4})\_{2}}{0.0250 L soln}×\frac{1 mol Fe\_{3}(PO\_{4})\_{2}}{357.475 g Fe\_{3}(PO\_{4})\_{2}}=0.658 M Fe\_{3}(PO\_{4})\_{2}$

* 1. Inventory the ions in the solution.

$$\frac{0.6581 mol Fe\_{3}(PO\_{4})\_{2}}{1 L soln}×\frac{3 mol Fe^{2+}}{1 mol Fe\_{3}(PO\_{4})\_{2}}=1.97 M Fe^{2+}$$

$$ \frac{0.6581 mol Fe\_{2}(SO\_{4})\_{3}}{1 L soln}×\frac{2 mol PO\_{4}^{3-}}{1 mol Fe\_{3}(PO\_{4})\_{2} }=1.32 M PO\_{4}^{3-} $$

1. Zinc reacts with hydrochloric acid according to the unbalanced reaction (6 points):

Zn (s) + 2 HCl (aq) 🡪 ZnCl2 (aq) + H2 (g)

How many milliliters of 1.50 M hydrochloric acid are required to react with 9.75 g of zinc?

$$9.75 g Zn×\frac{1 mol Zn}{65.382 g Zn}×\frac{2 mol HCl}{1 mol Zn}×\frac{1 L HCl soln}{1.50 mol HCl}×\frac{1000 mL}{1 L}=199 mL HCl soln$$