

CHM 2354

Assignment 1

Due Date: Tuesday January 25, beginning of class

Name: \_\_\_\_\_

Q1 /5

Student Number: \_\_\_\_\_

Q2 /10

Q3 /10

Total /25

Key

1. An unknown  $\text{Cu}^{2+}$  sample gave an absorbance of 0.262 in an atomic absorption analysis. Then 1.00 ml of solution containing 100.0 ppm  $\text{Cu}^{2+}$  was mixed with 95.0 ml of the unknown, and mixture was diluted to 100.0 ml in a volumetric flask. The absorbance of the new solution was 0.500. What is the concentration of  $\text{Cu}^{2+}$  in the sample? State any assumptions you might make and pay attention to significant figures.

- ① 1. Assume, at these concentrations absorbance is linearly proportional to concentration  $A \propto C$   
 2. Assume that blank has been accounted for or is insignificant.

Sol<sup>n</sup>: ① 
$$\frac{A(\text{unknown sample})}{A(\text{spiked sample})} = \frac{C(\text{unknown sample})}{C(\text{spiked sample})}$$
 ①

$$= \frac{C(\text{unknown sample})}{\frac{C(\text{unknown sample}) \times V_{\text{unknown sample}} + C_{\text{spike}} V_{\text{spike}}}{V_{\text{Total}}}}$$

$$\frac{0.262}{0.500} = \frac{C}{\frac{C(95) + 100\text{ppm}(1)}{100\text{ml}}}$$
 ①
 
$$0.524 = \frac{C}{(0.95C + 1)}$$

$$0.4978C + 0.524 = C$$

$$0.524 = 0.5022C$$

$$C = 1.04\text{ppm}$$
 ①



