CHEMISTRY 226
FINAL EXAM
DECEMBER 10, 2001

Name:_____ **Student ID No:**_____

I. (2 pts each) Define **eight** of the following terms. Clearly mark the two you do not want graded.

1. Resolution

2. Spectrometer

3. Masking

4. Reduction

5. Anode

6. Photoluminescence

7. Accuracy

8. Null Hypothesis

9. Eluent

10. Amphiprotic Solvent

II. A sample of sea water contains an average of 1.08×10^3 ppm Na^+ and 270 ppb SO_4^{2-}.

1. (4 pts) Calculate the mass Na^+ and SO_4^{2-} in 1 L of sea water assuming a density of 1.02 g/mL.

2. (2 pts) What is the molar concentration of SO_4^{2-} in units of μM?

III. (4 pts) Calculate the solubility product constant for a 4.7×10^{-6} M Ag_3PO_4 solution.

IV. (5 pts) The hydrogen sulfide in a 50.0 g sample crude petroleum was removed by distillation and collected in a solution of $CdCl_2$. The CdS precipitate was filtered, washed and ignited to $CdSO_4$. Calculate the % H_2S in the sample if 0.108 g $CdSO_4$ was recovered. MW ($CdSO_4$) = 208.47 g/mol; MW H_2S = 34.08 g/mol.

V. Consider the following set of data. Show all calculations.

Trial Number	Value (mL)
1	69.94
2	69.92
3	69.80

1. (2 pts) Calculate the mean.

2. (2 pts) What is the median?

3. (3 pts) Calculate the standard deviation.

4. (3 pts) Calculate the 95% confidence limit if we do not know σ.

5. (3 pts) Use the appropriate statistical test to determine if the 69.80 value is an outlier at the 95% CL.