系組：化學系三年級　　日期節次：7月29日第4節

科目：分析化學　(149-84)

A. Problems: 70%

1. A sample of insecticide weighing 2.60 g is analyzed for As by dissolving it in acid and adding H_2S in excess. Then, 0.5209 of As_2S_3 is obtained. Calculate the %As in the insecticide. As = 75, As_2S_3 = 246.

2. 40ml, 0.0/M NaCl is titrated with 0.0/M $AgNO_3$. Calculate the pAg when added 40ml of $AgNO_3$, Ksp of AgCl is $1.0\times10^{-10.0}$

3. A solution absorbs 30.0% of light (a) what fraction of light would be absorbed by a solution four times as the concentration? (b) What is the absorbance of a solution four times as the solution?

4. A sample is analyzed by L.C. for aspirin content. A aspirin peak is obtained with a height of 35 mm. If a standard that contains 1.0% by weight of aspirin is introduced, the peak height is 7 mm. What's the concentration (in wt%) of aspirin in the sample?

5. It is found that 15.0ml of 0.184 M $AgNO_3$ is required to react with a sample of bleach weighing 0.80g. Calculate $\%_{Cl^-}$ in the bleach. Cl = 35.5; Ag = 108.

6. Given that the K_a for NH_4^+ is 5.6×10^{-10}. Calculate the $[H^+]$ in 1.0 M NH_4Cl.

7. Calculate the pOH of a buffer solution prepared by mixing 200ml of 0.10 M NaF and 100ml of 0.050 M HF. $K_a = 7.2\times10^{-4}$ for HF, $\log 7.2 = 0.857$, $\log 2.0 = 0.301$.

B. Questions: 30%

1. Compare the maximum absorption shift in UV spectrum for the following compounds:
$-\overset{1}{C}=\overset{2}{C}-$; $-\overset{1}{C}=\overset{2}{C}-\overset{3}{C}=\overset{4}{C}-$; $-\overset{1}{C}=\overset{2}{C}-\overset{3}{C}=\overset{4}{C}-\overset{5}{C}=\overset{6}{C}-$

2. Give the maximum and minimum values of R_f.

3. In acid base titration, why indicators give color change?

4. What indicator can be used in redox titration involving iodine?

5. The first order constant for the radioactive decay of Ra-223 is 0.0606 day^{-1}. What is the half life of Ra-223?

6. What is the optimal volume of resolution, R_s, in L.C.?