1. Addition of an excess of $AgNO_3$ to a 0.5012g sample yielded a mixture of AgCl and AgI that weighed 0.4715g. The precipitate was then heated in a stream of Cl_2 to convert the AgI to AgCl. The precipitate was found to weigh 0.3922g after this treatment. Calculate the percentages of KI and NH_4Cl in the sample. If the weights measured have a relative standard deviation of 0.1%, what will be the standard deviations for the calculated percentages of KI and NH_4Cl. (10%)

2. Describe "in detail" the procedures for preparing one liter 0.01M standard EDTA solution from reagent grade $Na_2H_2.2H_2O$. (10%)

3. Give definitions or explain the following terms: (10%)
   1) confidence level, 2) sensitivity,
   3) end point, 4) noise

4. For the reversible reaction:
   $Ox + 4H^+ + 2e^- \rightleftharpoons R$
   the half-wave potential is -0.349V at a dropping mercury electrode from a solution buffered to pH 2.5. Predict the half-wave for this reaction at pH 3.5. (8%)

5. For the voltammetric studies of the following electrochemical reaction. Please select the preferred electrode from a)Hg, b)pt, and c)C. Give your reasons for your choice. (4%)
   (1) $M^+ + e^- \rightleftharpoons M$ $E^o = +1.05$ V (vs SCE).
   (2) $A + e^- \rightleftharpoons A^-$ $E^o = -1.20$ V (vs SCE).

6. Define Liquid Junction Potential and describe its effect on electrochemical methods. (4%)

7. What are the requirements for a solvent to be used for voltammetry (or polarography) experiments ? (4%)

8. 一般以螢光器去定量物質濃度時，在高濃度時並不遵守 F=KC (F: fluoresence power, C: concentration of analyte) 請說明其可能之原因。 (10%)

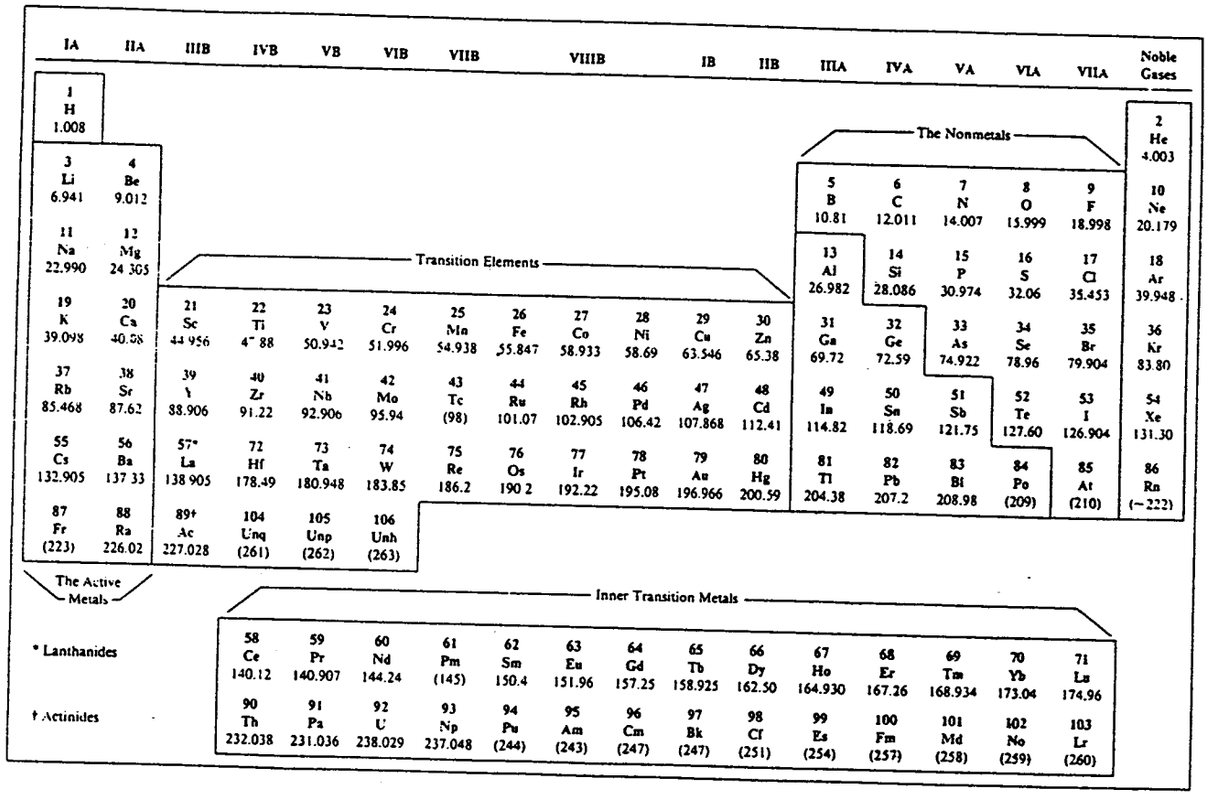
9. 試比較傅式轉換型儀器 (Fourier transfoorm instrument) 和傳統光譜儀之優缺點。 (10%)

10. 試比較氣體層析(gas chromatography)，液體層析(liquid chromatography)，及超臨界流體層析(supercritical fluid chromatography) 在分離速度、分離效率、及應用範圍之不同，並說明理由。(10%)

11. 試說明在充填式(packed column)及開管式(open tubular)管柱在層析法中影響分離效率(N)之因素，並說明。(10%)

12. 作定量分析時，如果樣品中有和被分析物不易分離之干擾物質存在時則用何種方法去定量最容易？(5%)

13. 測 (a)礦石中之鐵成份
    (b)合金中之鐵成份
    最快且最容易之方法是否相同，其原因爲何？(5%)


IA
IIA
IIIB
IVB
VB
VIB
VIIB
VIIIB
IB
IIB
IIIA
IVA
VA
VIA
VIIA
Noble Gases
The Nonmetals
Transition Elements
Inner Transition Metals
The Active Metals
* Lanthanides
† Actinides