東吳大學 102 學年度碩士班研究生招生考試試題

系級	化學系碩士班	考試時間	100 分鐘
科目	物理化學暨分析化學	本科總分	100 分

1. Define the following terms: (20 分)

   (A) Heisenberg uncertainty principle (海森堡測不準原理)

   (B) Le Chatelier's principle (勒沙特列原理)

   (C) The Second Law of Thermodynamics (熱力學第二定律)

   (D) Ideal Gas Equation (理想氣體方程式)

2. For a reaction A → B, a plot of 1/[A] versus time (t) is a straight line of slope k and intercept $1/[A]_0$. What is the rate law for this reaction? (10 分)

3. What is the point group for H_2O_2 and O_3? (10 分)

4. Describe the four processes in a Carnot cycle.(10 分)

5. Define the following terms: (30 分)
   (a) chemical ionization in MS
   (b) fluorescence
   (c) capillary electrophoresis
   (d) atomic absorption spectrometry
   (e) ionic strength
   (f) buffer solution

6. For reversed phase separation, predict the order of elution of benzene, phenol, biphenyl. (10 分)

7. Calculate the pH and pOH of a 0.001M HA(aq) solution ? (10 分)
   (HA: $K_a = 1.75 \times 10^{-5}$)