淡江大學 103 學年度碩士班招生考試試題

系別：化學學系　　科目：儀器分析

考試日期：3 月 2 日(星期日) 第 3 節　　本試題共 8 大題， 1 頁

1. Give the full names and definition of the following abbreviations used to characterize the performance of instruments. (15%)
   (a) LOD
   (b) LOQ
   (c) LOL

2. A solution containing 6.45 ppm of $KMnO_4$ had a transmittance of 0.191 in a 1.00 cm cell at 520 nm. What is the molar absorptivity of $KMnO_4$ at 520 nm? ($KMnO_4$: 158.034 g/mol) (8%)

3. Explain the difference between the electronic transition and lifetime for fluorescence and phosphorescence emission. (12%)

4. What is the working principle and applications of FTIR spectroscopy? What are the advantages of an FTIR spectrometer compared with a dispersive IR spectrophotometer? (15%)

5. Compare the differences between the electron impact (EI) and fast atom bombardment (FAB) as the ion sources for molecular mass spectrometry. (10%)

6. List the advantages and disadvantages of mercury film electrode compared with carbon electrodes in voltammetry. (10%)

7. According to van Deemter equation, what are the variables that lead to zone broadening in chromatography? What factors affect these variables? In these variables, which one is more significant in GC than in LC? Why? (20%)

8. Explain the separation principle, suitable analytes and the role of electroosmotic flow for capillary electrophoresis. (10%)