國立成功大學75學年度化學研究所考試(　　試題) 共一頁 第　頁

(1) Define the following terms:
a) Standard solution
b) Primary standard solution
c) Equivalent point and end point
d) Extinction coefficient
e) Electrolytic polarization (20%)

(2) Calculate the potential of a platinum electrode in contact with a solution of pH 4.0 containing 0.002 M quinone and 0.002 M hydroquinone.

Quinone $+ 2H^+ + 2e =$ hydroquinone $\quad E^\circ = 0.699$ V. (20%)

(3) Calculate the pH of a 0.50 M solution of hydroxylammonium chloride, $(NH_3OH)^+Cl^-$, that has been half neutralized with sodium hydroxide. The pK_b for hydroxylamine (NH_2OH) is 7.91. (20%)

(4) Calculate the theoretical plate number of a gas chromatograph when the eluent (carrier gas) flow is 20 ml/min, the retention time of a non-sorbed substance $t_M = 0.20$ min, and the retention time of a sample component $t_R = 3.64$ min for a solute peak of the width of the elution curve $W = 0.36$ min. (20%)

(5) In the spectrophotometric determination, a solution with absorbance A_1 is diluted to give a solution with A_2 such that $A_1 - A_2 = 0.50$. The second solution is diluted to give a solution with A_3 such that $A_2 - A_3 = 0.25$. Calculate T_3/T_1 ratio using just one equation. (20%)