

CHEMISTRY 31
Quiz 4 - SOLUTIONS
Spring, 2017

1. In a precipitation titration, Ba^{2+} is added out of a buret to a flask containing SO_4^{2-} forming solid barium sulfate. The concentration of initial ions and volumes is known. In order to determine $[\text{Ba}^{2+}]$ at a point before the equivalence point where the volume of Ba^{2+} added is measured, you want to first calculate:

- a) the initial $[\text{Ba}^{2+}]$ in the buret
- b) the excess $[\text{Ba}^{2+}]$ in the flask
- c) the mass of solid BaSO_4 in the flask
- d) the excess $[\text{SO}_4^{2-}]$ in the flask

Before the equivalence point, there will be excess sulfate in the flask and will greatly exceed any Ba. Thus we need to calculate excess $[\text{SO}_4^{2-}]$ in the flask to be able to calculate Ba^{2+} in equilibrium with the $[\text{SO}_4^{2-}]$

(4 pts)

2. A compound is known to have a molar absorbtivity of $731 \text{ M}^{-1} \text{ cm}^{-1}$ at a wavelength of 382 nm in water (solvent). A cell with path length of 0.200 cm is filled with the compound and the absorbance is measured to be 0.103. Determine the concentration of the compound. (6 pts)

$$A = \epsilon bC \text{ or } C = A/\epsilon b = 0.103/(731 \text{ M}^{-1} \text{ cm}^{-1})(0.200 \text{ cm}) = 7.05 \times 10^{-4} \text{ M}$$