CHEM210

GRAVIMETRIC ANALYSIS WORKSHEET

1. A student is performing a gravimetric analysis of lead in a mixture of lead nitrate and sodium nitrate using potassium iodide. Upon addition of excess precipitating agent the solution becomes cloudy. He filters and obtains a very small amount of yellow and white residue. He adds HNO3 to the cloudy filtrate.
2. What did the cloudy suspension obtained indicate about the dominant mechanism of precipitate formation?
3. What could account for the dominance of this mechanism?
4. Why did he obtain only a small amount of residue?
5. What is the most likely identity of the white salt in the residue?
6. What processes could possibly account for its presence in the residue?
7. What was the purpose of adding the nitric acid to the filtrate? Explain.
8. A lecturer advised the student to anticipate peptization.
   1. What is peptization?
   2. Under what circumstances can it occur?
   3. How can it be avoided?
9. Another lecturer advised the student to heat the HNO3 /filtrate mixture and stir for 2 hours.
   1. What is the name of this process?
   2. What is its purpose?
10. Calcium in a rock sample was precipitated as calcium oxalate. The precipitate was allowed to air dry and placed in a desiccator.
11. Assess the adequacy of this method of drying the precipitate.
12. Is there a difference between drying and ignition of precipitates? Explain your answer.
13. The student doing the analysis was not in possession of the thermal curve for calcium oxalate. What impact could that have on the accuracy of the analysis?
14. Calcium oxalate is moderately soluble in a mildly acidic aqueous environment. The bulk of the salt was precipitated under mildly acidic conditions, with the pH increased gradually by the addition of ammonia to facilitate the removal of most of the oxalate salt. Explain how this method of precipitation would give rise to a larger particle size. Include in your discussion the concept of relative supersaturation.
15. When a sample of impure potassium chloride (0.4500g) was dissolved in water and treated with an excess of silver nitrate, 0.8402g of silver chloride was precipitated. Calculate the percentage of KCl in the original sample.
16. If 19g of BaCl2(aq) is mixed with 42g of Na2SO4(aq) in 250 mL of water, what is the resulting precipitate, the mass of the resulting precipitate?
17. When aqueous solutions, like AgF and Sr(NO3)2 combine, the precipitate, SrF2 forms. Calculate the mass of the precipitate formed if 3.0L of 6.0M AgF and 12.0L of 0.10M Sr(NO3)2 are mixed.