

Quantitative Solution Calculations

1. Calculate the concentration of a solution formed by:
 - a) dissolving 3.20 mol of sodium chloride in enough water to make 800 mL total volume
 - b) dissolving 0.538 g of potassium phosphate in enough water to make 38.0 mL of solution
 - c) adding 5.00 mL of 6.00 M sulphuric acid to enough water to make 1.00 L of solution

2. Calculate the total volume of solution that would have a concentration of 0.100 M in each case:
 - a) a solution that contains 0.258 mol of silver nitrate
 - b) a solution that contains 15.2 g of auric nitrate
 - c) a solution that contains 13.1 mL of 1.50 M nitric acid

3. Calculate the following:
 - a) the amount (moles) of potassium nitrate in 450 mL of 0.250 M solution
 - b) the mass of ammonium nitrate in 380 mL of 3.5 M solution
 - c) the volume of 6.00 M hydrochloric acid required to make 5.50 L of 0.500 M hydrochloric acid solution

4. If 550 mL of 0.350 M barium chloride solution and 575 mL of 0.250 M sodium phosphate solution are mixed together, determine the following:
 - a) the limiting reagent
 - b) the name and the mass of the precipitate that forms
 - c) the concentration of the remaining ionic solution (assume a total volume of 1.125 L)

5. Calculate the mass of precipitate and the concentration of sodium nitrate solution that forms when 200 mL of 0.5 M strontium nitrate solution and 300 mL of 0.3 M sodium carbonate solution are mixed together (assume a total volume of 500 mL)

Answers:

1.	4.00 M	0.0667 M	0.0300 M
2.	2.58 L	0.397 L	0.197 L
3.	0.113 mol	106 g	0.458 L
4.	38.6 g	0.342 M	
5.	13.3 g	0.360 M	

Useful Formula:

1.	NaCl	K ₃ PO ₄	H ₂ SO ₄
2.	AgNO ₃	Au(NO ₃) ₃	HNO ₃
3.	KNO ₃	NH ₄ NO ₃	HCl