Solution Calculations – Introductory Questions

1. Calculate the amount (mol) for each compound given concentration (M) and volume (L or mL):
a) 0.300 M Na_2SO_4 with a volume of 3.00 L
b) 12.1 M HCl with a volume of 100 mL
c) 0.100 M $Pb(NO_3)_2$ with a volume of 10.0 mL
d) 3.5 M $AgNO_3$ with a volume of 500 mL
e) 0.00300 M MgS with a volume of 2.00 mL

2. Find the concentration (M) of each of the following solutions:
a) 3.00 mol NaCl in 1.50 L
b) 8.00 mol of KNO_3 in 80.0 L
c) 0.300 mol KCl in 20.0 mL

3. Find the volume of each of the following solutions:
a) 5.00 mol H_2SO_4 forms a 3.00 M solution
b) 2.00 mol HNO_3 forms a 0.0500 M solution
c) 0.500 mol NaCl forms a 0.800 M solution

4. Find the mass of NaCl required to make each of the following solutions:
a) 10.0 mL of 2.00 M solution
b) 130 mL of 0.0500 M solution
c) 2.00 L of 3.00 M solution

5. Find the volume of stock 12.1 M HCl required to make each solution:
a) 1.00 L of 0.100 M solution
b) 100 mL of 0.600 M solution
c) 2.00 L of 0.0100 M solution

Answers:

1.	0.900 mol	3.	1.67 L
	1.21 mol		40.0 L
	0.00100 mol		0.625 L
	1.75 mol		
	6.00×10^{-6} mol	4.	1.17 g
			0.380 g
2.	2.00 M		351 g
	0.100 M		
	15.0 M	5.	8.26 mL
			4.96 mL
			1.65 mL