Diluting a Solution
Worksheet

$$C_1V_1 = C_2V_2$$

1) You add 400 mL of water to 200 mL of a 3 mol/L solution of hydrogen peroxide. Calculate the new concentration.

2) You are supplied with 250 mL of a 0.4 mol/L solution. You add 250 mL of water to the solution. What is the concentration of the resulting solution?

3) What volume of 6 mol/L HCl is required in the preparation of 100 mL of 1 mol/L HCl?

4) You are supplied with a 200-mL plastic bottle filled to capacity with 6mol/L solution of KCN, a poison. The plastic bottle is placed in a large beaker containing 1.0 L of water. The plastic bottle leaks. What is the final concentration of the solution in the large beaker when the plastic bottle is completely empty?

5) You are given a 1.0 mol/L solution of KOH. Using this solution, you must prepare 100 mL of a diluted solution that will have a concentration of 0.25 mol/L.
   a) What volume of the initial solution should be used?
   b) How much water should be added?

6) You have 500 mL of a 3 mol/L KOH solution. You add 1000 mL of distilled water to the solution. What is the concentration of the diluted solution?

7) What volume of 12 mol/L HCl solution is required in the preparation of 1.0 L of a 1.0 mol/L solution?

8) What is the concentration of a solution made by diluting 8.00 mL of a 0.20 mol/L solution with 12.0 mL water?

Answers
1) 1 mol/L
2) 0.2 mol/L
3) 16.67 mL
4) 1 mol/L
5) 25 mL, 75 mL
6) 1 mol/L
7) 83.3 mL
8) 0.08 mol/L

Review on Solutions and Dilutions

1) When 17.0 g NaCl are dissolved in distilled water and the final volume is adjusted to 450 mL, what is the concentration of the solution, in mol/L?

2) How many grams of KBr are required in the preparation of 200 mL of a 1.25 mol/L solution?

3) What mass of NaOH is required in the preparation of 1.0 L of a 2.5×10^{-2} mol/L solution?

4) A technician dissolves 12.0 g $Ba(NO_3)_2$ in sufficient distilled water and adjusts the final volume to 1.00 L. Calculate the concentration of $Ba(NO_3)_2$ in mol/L.

5) If 1.00 L of water is added to 2.00 L of a 1.2 mol/L solution of HCl, what will be the resulting concentration?

Answers

1) 0.646 mol/L
2) 29.75 g
3) 1.0 g
4) 4.6×10^{-2} mol/L
5) 0.8 mol/L