Molarity and Dilutions Worksheet

1. Calculate the final concentration of a solution that is made by dissolving 14.8 g of solid sodium hydroxide in 600.0 mL of solution.

2. If I add water to 100 mL of a 0.15 M NaOH solution until the final volume is 150 mL, what will the molarity of the diluted solution be?

3. If I add 25 mL of water to 125 mL of a 0.15 M NaOH solution, what will the molarity of the diluted solution be?

4. I have 345 mL of a 1.5 M NaCl solution. If I boil the water until the volume of the solution is 250 mL, what will the molarity of the solution be?

5. How much water would I need to add to 500 mL of a 2.4 M KCl solution to make a 1.0 M solution?

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1. Calculate the final concentration of a solution that is made by dissolving 14.8 g of solid sodium hydroxide in 600.0 mL of solution.

    C = n/V, we need to find n to do this calculation.
    n = m/MM → n = 14.8 /40.0 = 0.370 mol
    C = 0.370 mol/ 0.600 L = 0.617 M

2. If I add water to 100 mL of a 0.15 M NaOH solution until the final volume is 150 mL, what will the molarity of the diluted solution be?

    $$M_1V_1 = M_2V_2$$
    (0.15 M)(100 mL) = x (150 mL)
    x = 0.100 M

3. If I add 25 mL of water to 125 mL of a 0.15 M NaOH solution, what will the molarity of the diluted solution be?

    $$M_1V_1 = M_2V_2$$
    (0.15 M)(125 mL) = x (150 mL)
    x = 0.125 M

4. I have 345 mL of a 1.5 M NaCl solution. If I boil the water until the volume of the solution is 250 mL, what will the molarity of the solution be?

    $$M_1V_1 = M_2V_2$$
    (1.5 M)(345 mL) = x (250 mL)
    x = 2.07 M

5. How much water would I need to add to 500 mL of a 2.4 M KCl solution to make a 1.0 M solution?

    $$M_1V_1 = M_2V_2$$
    (2.4 M)(500 mL) = (1.0 M) x
    x = 1200 mL

    1200 mL will be the final volume of the solution. However, since there's already 500 mL of solution present, you only need to add 700 mL of water to get 1200 mL as your final volume. The answer: 700 mL.