

WKS
Molarity Calculations

Name _____
Period _____ Date _____

- 1) Lye (NaOH) is an effective drain cleaner. Suppose one needed to make 100.0 mL of 0.100 M NaOH solution.
 - a) Calculate the grams of NaOH needed to make the solution.

 - b) Explain how one would make this solution. Be specific about quantities and what equipment to use.

- 2) A hydrate of sodium thiosulfate, known as hypo ($\text{Na}_2\text{S}_2\text{O}_3$), is used as a fixer in photography because it dissolves silver compounds. Suppose one needs to prepare 250.0 mL of 0.120M solution of hypo.
 - a) Calculate the grams of hypo needed to make this solution.

 - b) Explain how one would make this solution. Again, be specific.

- 3) What is the molar concentration (molarity) of a solution in which 0.240 mole of washing soda (Na_2CO_3) is dissolved in water to make 500.0 mL of a solution for softening water.

- 4) In car batteries, 6.0 M H_2SO_4 (sulfuric acid) is used. Suppose one wished to use an 18.0M H_2SO_4 solution that was purchased to make 2.0 liters of 6.0M battery acid.
 - a) Calculate the volume of the 18.0M H_2SO_4 needed to make the desired amount of battery acid.

 - b) Explain how one would make this solution. Specific!

- 5) One of the uses of methanol (CH_3OH) in dilute form is as windshield washer antifreeze. In pure form, methanol has a molar concentration of 24.7M. Suppose one wished to dilute pure methanol to make 8.0 L of 10.0M methanol.
- What volume of the pure methanol (24.7M) must be used?
 - Explain how one would make this methanol solution. Specific!
- 6) A sample of household ammonia contains 156g of NH_3 gas dissolved in water to form 2.0 L of solution. What is the molarity of the household ammonia?
- 7) If you dilute 100. mL of a 0.15 M NaOH solution to a final volume of 150. mL, what will the molarity of the diluted solution be?
- 8) You have 345 mL of a 1.5 M NaCl solution. If you evaporate the water until the volume of the solution is reduced to 250. mL, what will the molarity of the solution be?

Answers: 1a) 0.400 g NaOH; 2a) 4.75 g $\text{Na}_2\text{S}_2\text{O}_3$; 3) 0.480 M Na_2CO_3 (aq); 4a) 0.67 L; 5a) 3.2 L; 6) 4.6 M NH_3 (aq); 7) 0.10 M NaOH; 8) 2.07 M NaCl