

Answer on Question #59643, Chemistry / General Chemistry

1. You have 2.0 L sodium hydroxide solution that has a concentration of 0.4 Molar. You need to make 500mL of a .1 Molar solution. How many mL of concentrated solution are needed?

Solution:

We need 500mL 0.1M solution.

$$C_M = 0.1 \text{ mol/L}$$

$$C_M = \frac{n}{V} \quad n = C_M \times V$$

$$n = 0.1 \text{ mol/L} \times 0.5 \text{ L} = 0.05 \text{ mol.}$$

We need 0.05 mol of solute.

We find the volume of a concentrated solution which contains 0.05 mol of solute:

$$C_M = 0.4 \text{ mol/L}$$

$$C_M = \frac{n}{V} \quad V = \frac{n}{C_M}$$

$$V = \frac{0.05 \text{ mol}}{0.4 \text{ mol/L}} = 0.125 \text{ L} = 125 \text{ mL}$$

Answer: We need 125mL of concentrated solution .