

## Question #81279, Chemistry / General Chemistry

(a) How many milliliters of a stock solution of 14.0 M HNO<sub>3</sub> would you have to use to prepare 0.500 L of 0.200 M HNO<sub>3</sub>?

(b) If you dilute 18.0 mL of the stock solution to a final volume of 1.00 L, what will be the concentration of the diluted solution?

Answer:

(a) How many milliliters of a stock solution of 14.0 M HNO<sub>3</sub> would you have to use to prepare 0.500 L of 0.200 M HNO<sub>3</sub>?

Formula:

$$C_M = n/V$$

n – Moll, V – volume.

Therefore  $n = C_M \times V$  and  $V = n / C_M$

$$n = 0.2 \times 0.5 = 0.1$$

$$V = 0.1 / 14 = 0.007142 \text{ L} = 7.142 \text{ ml}$$

$$V = 7.142 \text{ ml}$$

(b) If you dilute 18.0 mL of the stock solution to a final volume of 1.00 L, what will be the concentration of the diluted solution?

$$C_M = n/V$$

n – Moll, V – volume.

Therefore  $n = C_M \times V$  and  $V = n / C_M$

$$n = 14 \times 0.018 = 0.252 \text{ moll}$$

$$C_M = n/V = 0.252 \text{ moll} / 1 \text{ L} = 0.252 \text{ M}$$

$$C_M = 0.252 \text{ M}$$

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