Question #64699, Chemistry / Physical Chemistry

A 60.0 mL 0.513 M glucose solution is mixed with 120.0 ml of 2.33 M glucose solution. Calculate the final concentration of glucose (assume volumes are additive)

Answer*:*
Moles and volumes are additive:

$$V = 60.0\ mL + 120.0\ mL = 180.0\ mL = 0.180\ L$$

$$c = \frac{n}{V}$$

$$n = c \times V$$

$$n = 0.513\frac{mol}{L} \times 0.06\ L + 2.33\frac{mol}{L} \times 0.120\ L = 0.03078\ mol + 0.2796\ mol$$

$$= 0.31038\ mol$$

$$c = \frac{0.31038\ mol}{0.180\ L} = \mathbf{1.72\ \frac{mol}{L}\ or\ 1.72\ M}$$