Dilution and Solute Conservation Worksheet

Scoring guide · one credit per question · review written work against each rubric

Dilution and Solute Conservation

Question 1

Choice (2)

M_2 = (0.500 M)(40.0 mL)/(100.0 mL) = 0.200 M.

Question 2

V_1 = (0.240 M)(250. mL)/(1.20 M) = 50.0 mL.

Question 3

The same amount of solute is spread through a larger solution volume. Moles per liter decreases as volume increases.

Question 4

Choice (1)

M_2 describes the whole diluted solution, so V_2 is its final volume.

Dye Standards for a Colorimeter

Question 5

Choice (2)

Q has the greatest stock-to-final volume ratio, 15.0/60.0. P and R each have a ratio of 1/6.

Question 6

M_2 = (0.120 M)(15.0 mL)/(90.0 mL) = 0.0200 M.

Question 7

Yes. Both started with 15.0 mL of the same 0.120 M stock, so each contained (0.120 mol/L)(0.0150 L) = 0.00180 mol of dye. Adding solvent changes concentration and preserves this amount.

Question 8

Choice (2)

P and R both dilute the stock by a factor of six, so each is 0.0200 M. Their final volumes are 60.0 and 90.0 mL.