Mixing Two Model Rain Samples

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

Mixing Two Model Rain Samples

Question 1

Choice (2)

The volumes match, so the ratio of the amounts is the ratio of the concentrations. P has ten times as much hydrogen ion as Q.

Question 2

P contributes 5.0×10^{-6} mol and Q contributes 5.0×10^{-7} mol. The total is 5.5×10^{-6} mol in 1.00 L, or 5.5×10^{-6} mol/L. Averaging the two concentrations is equivalent for these equal volumes.

Question 3

The mixture’s 5.5×10^{-6} mol/L is higher than the 3.2×10^{-6} mol/L at pH 5.5. Higher hydrogen ion concentration means lower pH, so the mixture pH is below 5.5.

Question 4

The added portion has a lower concentration than the mixture. Adding its volume and its small amount of hydrogen ions lowers the weighted average concentration, moving it closer to Q.