Comparing Two Model Dye Baths at Neutral pH

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

Comparing Two Model Dye Baths at Neutral pH

Question 1

Choice (3)

They both start at 7.0. Q rises by 0.2 pH unit, while P rises by 2.0 pH units.

Question 2

At pH 7.0 the concentration is 10^{-7} mol/L. At pH 9.0 it is 10^{-9} mol/L. The final concentration is 1/100 of the starting concentration, a decrease by a factor of 100.

Question 3

The particles consume some added hydroxide, leaving less free OH^- than if all the base remained unreacted. That can make the increase in pH smaller.

Question 4

No. The first addition raised Q’s pH by 7.2 − 7.0 = 0.2 unit. The second raised it by 8.8 − 7.2 = 1.6 units. Q shows a larger pH change for the second equal dose.