Checking Rate Readings in Two Volumes

Base your answers on the information provided and your knowledge of chemistry. Use the 2025 Chemistry Reference Tables as needed.

A classroom reaction model consumes a dissolved reactant in two well-mixed containers. The volumes stay fixed. The class records concentration in moles per liter. It wants to compare how many moles of reactant are used each second.

Run	Volume (L)	Initial concentration (mol/L)	Concentration after 4.0 s (mol/L)
P	0.100	0.100	0.060
Q	0.200	0.100	0.080

1 Which run shows the larger drop in concentration during the recorded interval?

(1) P only

(2) Q only

(3) The drops are equal.

(4) The concentrations rise in both runs.

2 Calculate the average amount of reactant consumed per second in each run. Show how each volume enters the calculation. [1]

Answer and work

3 A student says P used more moles of reactant because its concentration fell more. Evaluate the claim. [1]

Answer and work

A follow-up uses the same volume as Q and gives a concentration drop of 0.040 mol/L in 4.0 s.

4 Compare the average rate in moles per second in the follow-up with the original Q rate. Explain why. [1]

Answer and work