Temperature and Reaction Rate Worksheet

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

Temperature and Reaction Rate

Question 1

Choice (2)

The higher-temperature distribution puts a greater fraction of particles at or above the energy needed for reaction.

Question 2

More collisions have enough energy to cross the unchanged barrier. This can increase the number of successful collisions per unit time.

Question 3

Choice (1)

The same product amount divided by a smaller time gives a larger average rate.

Question 4

Concentration can change how often reactant particles collide. Holding it constant allows a rate difference to be attributed to temperature under the controlled conditions.

Timing a Fixed Product Amount

Question 5

Choice (3)

R makes the same product amount in the shortest time, 30 s.

Question 6

The average rate is 0.120 mol ÷ 40 s = 0.0030 mol/s.

Question 7

Choice (3)

R reaches the same endpoint in half the time. The average rate is therefore twice that of P.

Question 8

At 330 K, more collisions can meet the energy requirement than at 290 K. More successful collisions per unit time let R reach the fixed amount in 30 s instead of 60 s.