Collision Theory Worksheet

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

Collision Theory

Question 1

Choice (2)

A successful collision satisfies both the energy and orientation conditions.

Question 2

The powder exposes more surface area to the solution, allowing more collisions between reactant particles per unit time.

Question 3

Choice (1)

Heating shifts the distribution of particle energies so a larger fraction of collisions can meet the energy requirement.

Question 4

They may collide in an orientation that does not allow the necessary bonds to break or form.

Model Reaction Trials

Question 5

Choice (1)

Runs A and B have the same temperature and differ in the concentration of X.

Question 6

Choice (2)

B has the largest number of successful collisions, 23, in the same interval.

Question 7

A and C both use relative concentration 1. Raising temperature from 290 K to 310 K raises the count from 12 to 20. At the higher temperature a larger fraction of collisions have enough energy to react.

Question 8

Keep the relative concentration of X at 2 and set the temperature to 310 K. Count successful collisions during another 1.0 s interval, with the volume and concentration of Y still fixed.