Bond Energy and Reaction Energy Worksheet

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

Bond Energy and Reaction Energy

Question 1

Choice (1)

Energy is needed to separate atoms held by a bond.

Question 2

The net change is 450 kJ − 600 kJ = −150 kJ. The negative sign indicates energy is released overall.

Question 3

Choice (3)

Two bonds release 2 × 200 kJ = 400 kJ.

Question 4

The two magnitudes are equal for the same bond and states. Breaking absorbs energy and forming releases it.

Model Bond Ledger

Question 5

Choice (1)

The reactants are one mole H_2 and one mole Cl_2. Each molecule contains one bond of its own type.

Question 6

Breaking the reactant bonds needs 436 + 243 = 679 kJ. Forming two moles of H–Cl releases 2 × 431 = 862 kJ. The net estimate is 679 − 862 = −183 kJ.

Question 7

Choice (2)

Formation releases 862 kJ and breaking requires 679 kJ, so the reaction releases energy overall.

Question 8

Bond breaking takes energy into the system, so its contribution is positive. Bond formation releases energy, so its contribution is negative.