Tracking Light Energy in Two Leaf Trials

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

A leaf display models photosynthesis under two lamps. It accounts for absorbed light energy as heat transferred to the surroundings plus the gain in chemical energy stored by the reaction. Ignore other transfers. The records give energy in model units.

Trial	Energy arriving	Energy absorbed	Energy released as heat
P	80	60	40
Q	80	50	35

1 Which two readings are needed to calculate the stored energy for one trial?

(1) Energy arriving and energy absorbed

(2) Energy arriving and energy released as heat

(3) Energy absorbed and energy released as heat

(4) Only energy arriving

2 Find and compare the energy stored in the products of the two trials. [1]

Answer and work

3 A student says equal arriving energy must give equal stored energy. Explain what happens to the incoming energy before and after absorption. [1]

Answer and work

In a third trial the leaf absorbs 50 units. An independent product measurement gives 20 stored units.

4 Predict the heat transfer in the third trial. Compare it with Q. [1]

Answer and work