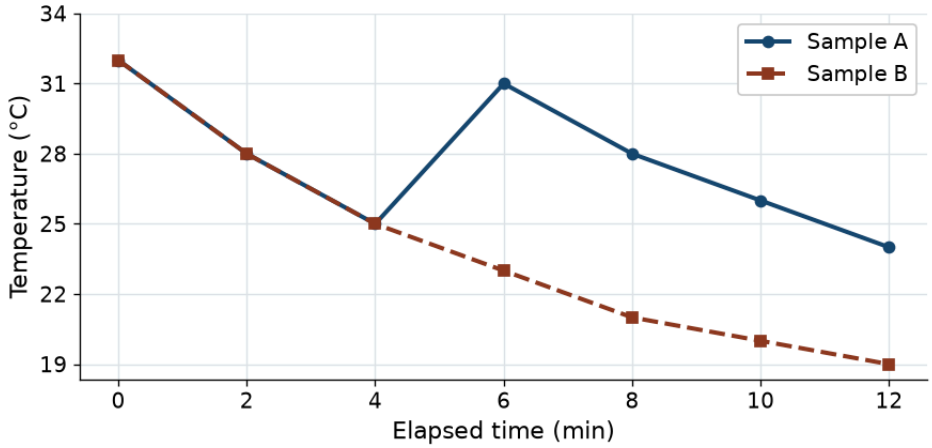
**Reading a Crystallization Temperature Spike**

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

A class models two liquid samples cooling in the same cabinet. Neither has a heater. At minute 4 each sample receives a small crystal seed. Treat the seeds as too small to change the temperatures directly. Crystals then grow in A but do not grow in B.




Temperature readings for samples A and B.

**1** Which observation distinguishes A from B just after minute 4?

(1) A warms while B continues to cool.

(2) Both samples warm by the same amount.

(3) A cools while B warms.

(4) Both samples stay at 25 °C.

**2** Explain how the growing crystals can account for A warming without a heater. [1]

Answer and work

In a simple energy model, the warming of A requires 10 J of thermal energy per degree Celsius. From minute 4 to minute 6 another 20 J leaves A for the cabinet.

**3** Estimate the total energy released by crystallization in A during that interval. Include the thermal energy gain and the transfer to the cabinet. [1]

Answer and work

**4** A student estimates the energy release from the temperature rise alone. Explain why that estimate is smaller than the total in this model. [1]

Answer and work