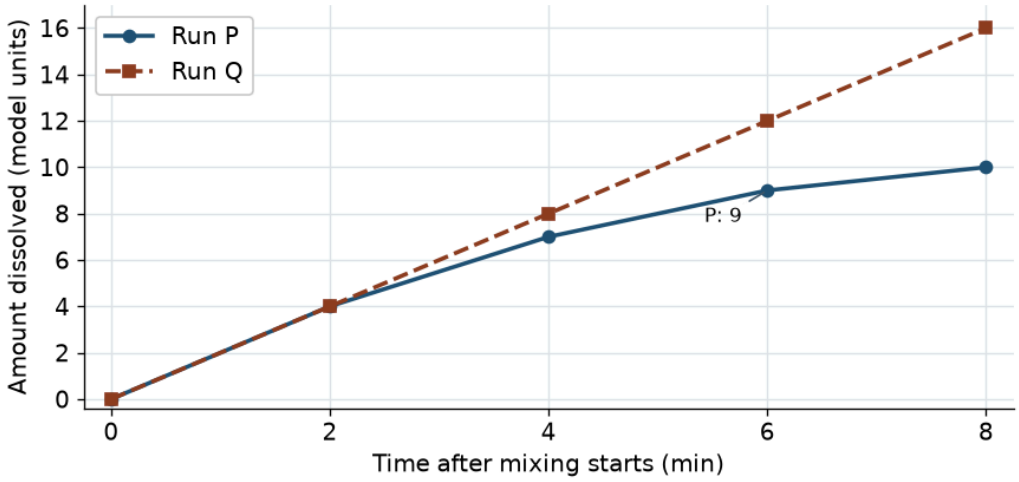
Reading a Dissolving Test That Cools

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

A classroom display tracks how much of a solid dissolves in two model cups. Each starts with the same water amount, temperature, solid mass, grain size, and stirring rate. The solid takes energy from the water as it dissolves. In the model, neither cup reaches its solubility limit during the period shown.



Dissolved amounts from matched starts.

1 Which pair of readings shows that the two runs have the same average dissolving rate over the first two minutes?

(1) P and Q both reach four units at two minutes from zero.

(2) P and Q both reach eight units at four minutes.

(3) P reaches ten units and Q reaches sixteen at eight minutes.

(4) Only P starts at zero.

2 Calculate how many units dissolve in each run from minute two through minute eight. [1]

Answer and work

The temperature log shows that P cools from 25 to 19 °C. A heater in Q keeps it at 25 °C. The other conditions remain matched.

3 A student says less of the solid dissolves in P because its water reaches its solubility limit. Evaluate the claim using the stated conditions and the temperature record. [1]

Answer and work

4 The class runs matched cups held at 19 and 25 °C. Identify one factor besides temperature to control and the measurement it should compare to check for a difference in dissolving rate. [1]

Answer and work