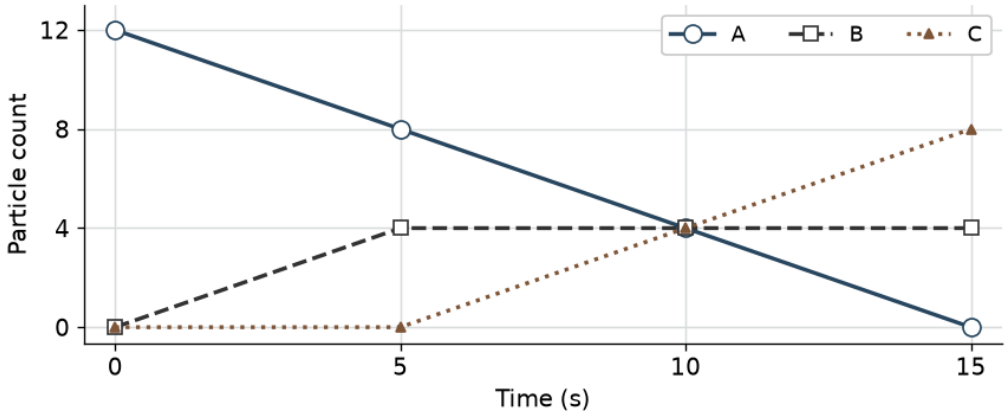
Checking a Reaction With a Steady Intermediate

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

A reaction display changes A into an intermediate B and then changes B into product C. Each step changes one particle into one particle. The container is sealed and the display counts all three forms. C does not change into another form.



Particle counts at four times. Lines connect successive readings.

1 Which count stays the same from 5 to 15 seconds?

(1) A only

(2) B only

(3) C only

(4) All three

2 Use the graph to find how many particles enter B from A and how many leave B for C from 5 to 10 seconds. [1]

Answer and work

A repeat follows the graph through 10 seconds. Then the container is cooled. At 15 seconds the repeat contains two A, four B, and six C particles.

3 A student says cooling made no difference because the count of B at 15 seconds was still four. Use both trials to compare the amounts that changed in each step from 10 to 15 seconds. [1]

Answer and work

4 The cooled container remains sealed until all A and B eventually become C. Predict the final C count and explain how the slower steps affect the amount at 15 seconds and the final amount. [1]

Answer and work