

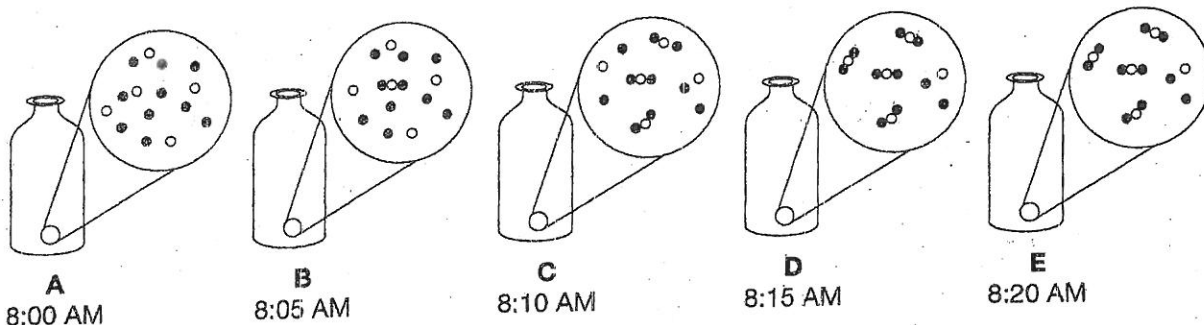
16-1 Apply

Equilibrium in a Bottle

In the lab, Alejandro mixes two gases, A and B, inside a sealed bottle. He knows that A and B react with each other to form substance A_2B , and that A_2B decomposes to form A and B. This reversible reaction can be represented by the following balanced equation: $2A + B \rightleftharpoons A_2B$

The pictures below show molecules of A, B, and A_2B per unit volume over a 20-minute period. After examining these pictures, answer the questions below on Alejandro's experiment.

• = A, ○ = B, ●● = A_2B



1. In which of the pictures A-E is the system at equilibrium? How can you tell?

2. How many molecules of each substance per unit volume are present at equilibrium?

3. Predict how many molecules of A_2B per unit volume Alejandro would measure at equilibrium if he had started with half as much of substances A and B.

4. How would the reaction have proceeded if Alejandro had started with only A_2B in the bottle?
