Tracking Salt Across a Model Tank

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

A tank model has two halves, A and B, with 0.200 L of water in each. Salt can move between the halves after a divider opens, and the model keeps each half well mixed. The volume of each half stays fixed, and no salt enters or leaves the tank during the first test.

Time after opening (min)	A concentration (g/L)	B concentration (g/L)
0	8.0	2.0
2	6.0	4.0
6	5.0	5.0

1 Which reading first shows no concentration difference between the halves?

(1) The A reading at 0 min

(2) The B reading at 2 min

(3) The pair of readings at 6 min

(4) The pair of readings at 2 min

2 Calculate the net mass of salt that moved into B during the first two minutes. Show how the volume enters the calculation. [1]

Answer and work

3 Use both halves at the start and at six minutes to evaluate the claim that the decrease in A means salt left the tank. [1]

Answer and work

A repeat starts with the original amounts. At six minutes the new readings are 5.0 g/L in A and 4.0 g/L in B. The volumes are still 0.200 L, and the model confirms both readings.

4 Use the new readings to decide whether movement between the halves alone can account for the result. [1]

Answer and work