Checking a Rate When Product Dissolves

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

A model reaction starts with no product gas. Some of the gas it forms dissolves in the liquid. The rest enters a collector. There are no other product locations or losses. A separate detector estimates dissolved product at the same times as the collector reading.

Time (s)	Dissolved product (model units)	Collected product (model units)
0	0	0
5	6	0
10	10	2
15	10	8

1 Which record first shows that product formed even though nothing had reached the collector?

(1) The 0-second record

(2) The 5-second record

(3) The 10-second record

(4) The 15-second record

2 Find the total product amount at five, ten, and fifteen seconds. Use both locations. [1]

Answer and work

3 A student uses the rising increments in the collector to say that the average formation rate is increasing. Evaluate the claim for the three five-second intervals. [1]

Answer and work

A repeat starts with the liquid already holding its maximum of ten product units. The collector begins empty. The model holds the dissolved amount at ten throughout this repeat and forms the same amount of new product as before.

4 Predict the collector reading at five seconds. Explain how the starting dissolved amount affects that result. [1]

Answer and work