Checking Where Bubbles Come From in Water

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

A classroom model warms equal amounts of water at 1 atm. Sample P contains dissolved air. Sample Q has very little dissolved air. Both start at the same temperature. In the model, warming can release dissolved air while the water remains below its boiling temperature.

Observation	**Sample P**	**Sample Q**
Wall bubbles at 60 °C	Many	Few
Sustained bubbling at 100 °C	Yes	Yes
Temperature during sustained bubbling	100 °C	100 °C

1 Which comparison supports the idea that some early bubbles come from dissolved air?

(1) The samples start at the same temperature.

(2) At 60 °C P shows many wall bubbles while Q shows few.

(3) Both samples show sustained bubbles at 100 °C.

(4) Both temperatures remain at 100 °C during sustained bubbling.

2 Compare the 60 °C and 100 °C observations. Explain how the amount of dissolved air changes the early record while both samples show the same evidence of boiling later. [1]

Answer and work

The model collects some gas from each stage and cools it. Water vapor can condense in the collector. The gases in air remain gases there.

3 What observation in the collector would show that water vapor was present? Explain. [1]

Answer and work

4 A student says water molecules must split before entering a boiling bubble. Evaluate the claim using a particle model of boiling. [1]

Answer and work