Checking Pressure After a Solid Runs Out

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

A sealed display models a solid S breaking into another solid and a gas. Each S unit can supply one gas unit. At this temperature and volume the display settles at eight gas units when both solids remain. If all S is used before it can supply eight, the gas amount is limited by the amount of S available.

Trial	Starting S units	Gas units after settling
P	5	5
Q	12	8

1 In which trial is the gas amount limited by running out of S?

(1) P only

(2) Q only

(3) Both

(4) Neither

2 Calculate how much S remains in each trial. Use the one-to-one model. [1]

Answer and work

3 A student says the different settled gas readings prove the temperatures were different. Evaluate the claim with the two starting amounts. [1]

Answer and work

The display adds six S units to P without adding or removing gas or changing the temperature or volume.

4 Predict the new gas count and how many of the added S units remain. [1]

Answer and work