Checking Why a Soaked Block Sinks

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

A display compares two porous blocks with the same dry mass and the same outside volume. After exposure to water, each is enclosed in an identical thin sleeve that keeps its retained water inside and prevents tank water from entering. In this model the sleeve adds negligible mass and volume. The enclosed block floats if its average density is less than 1.00 g/cm^3.

Block	**Dry mass (g)**	**Outside volume (cm^3)**	**Mass after exposure (g)**
P	12	20	12
Q	12	20	22

1 Which block sinks after exposure and enclosure in the model?

(1) P only

(2) Q only

(3) Both blocks

(4) Neither block

2 Calculate the mass of water retained by each block. Show how you use the dry mass. [1]

Answer and work

3 A student says equal dry density guarantees the same behavior in the tank after exposure. Evaluate the claim using both mass readings. [1]

Answer and work

The class considers a third 12 g block of the same outside volume. It can retain 7 g of water during exposure.

4 Predict whether the enclosed third block will float after exposure. Show the average density. [1]

Answer and work