Comparing Grain Contacts in a Model Sample

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

A classroom display compares equal masses of two powders, P and Q. Students measure how easily electric charge moves through one grain and through a container filled with many grains. The powder container has contacts on its two ends. A continuous chain of touching conducting grains can carry charge between the contacts.

Sample	A single grain conducts	Loose bed conducts	Pressed bed conducts
P	Yes	No	Yes
Q	No	No	No

1 Which evidence supports a change in contact pathways when P is pressed?

(1) An individual grain of P conducts, and only the pressed bed of P conducts.

(2) Both the loose and pressed beds of Q fail to conduct.

(3) A single grain of Q fails to conduct.

(4) Both loose beds fail to conduct.

2 Explain why an individual P grain can conduct when the loose bed cannot conduct from one end to the other. [1]

Answer and work

The class keeps the pressed P grains in place. A thin barrier that does not conduct is placed across the middle of the bed. It separates all the grains on one side from all the grains on the other side.

3 Predict whether the entire bed conducts from contact to contact after the barrier is added. Explain using the grain model. [1]

Answer and work

4 Describe how to test whether pressing permanently changed the conductivity of the individual P grains. Explain what result would support the contact-path model. [1]

Answer and work