

6. A student is studying the properties of CaSO_4 and PbSO_4 . The student has samples of both compounds, which are white powders.
- (a) The student tests the electrical conductivity of each solid and observes that neither solid conducts electricity. Describe the structures of the solids that account for their inability to conduct electricity.

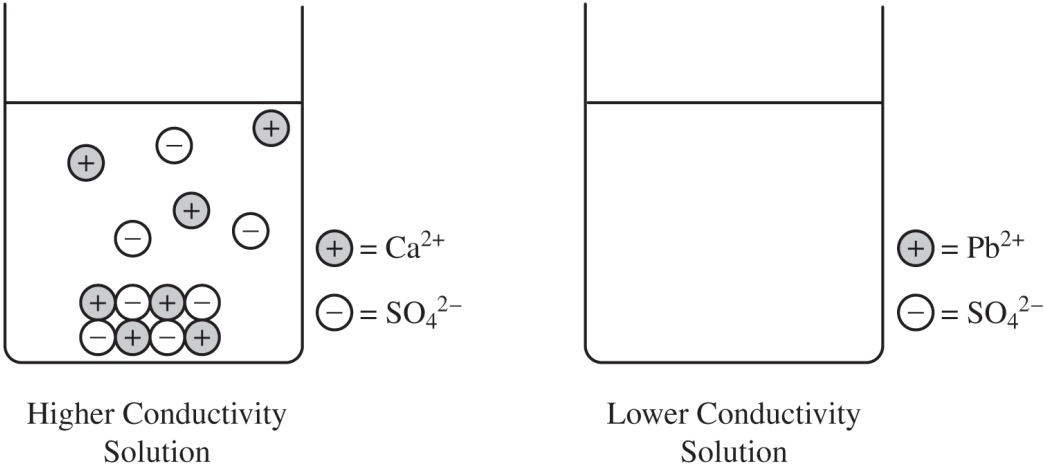
The student places excess $\text{CaSO}_4(s)$ in a beaker containing 100 mL of water and places excess $\text{PbSO}_4(s)$ in another beaker containing 100 mL of water. The student stirs the contents of the beakers and then measures the electrical conductivity of the solution in each beaker. The student observes that the conductivity of the solution in the beaker containing the $\text{CaSO}_4(s)$ is higher than the conductivity of the solution in the beaker containing the $\text{PbSO}_4(s)$.

- (b) Which compound is more soluble in water, $\text{CaSO}_4(s)$ or $\text{PbSO}_4(s)$? Justify your answer based on the results of the conductivity test.

GO ON TO THE NEXT PAGE.

Use a pencil or pen with black or dark blue ink only. Do NOT write your name. Do NOT write outside the box.

The left side of the diagram below shows a particulate representation of the contents of the beaker containing the $\text{CaSO}_4(s)$ from the solution conductivity experiment.



- (d) The student attempts to increase the solubility of $\text{CaSO}_4(s)$ by adding 10.0 mL of 2 M $\text{H}_2\text{SO}_4(aq)$ to the beaker, and observes that additional precipitate forms in the beaker. Explain this observation.

GO ON TO THE NEXT PAGE.

Use a pencil or pen with black or dark blue ink only. Do NOT write your name. Do NOT write outside the box.