Checking an Unknown Salt With Two Tests

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

A classroom simulation compares dissolved salts. Reference test A makes a visible solid if chloride is present, and reference test B makes a visible solid if sulfate is present. The simulation uses a fresh portion for each test and gives the following records for pure salts.

Reference salt	**Test A**	**Test B**
Sodium chloride	Solid	No solid
Potassium chloride	Solid	No solid
Sodium sulfate	No solid	Solid
Potassium nitrate	No solid	No solid

1 Which pure reference fits an unknown that gives no solid in test A and a solid in test B?

(1) Sodium chloride

(2) Potassium chloride

(3) Sodium sulfate

(4) Potassium nitrate

2 Explain why the two tests cannot distinguish sodium chloride from potassium chloride. [1]

Answer and work

A second unknown gives a solid in both tests. It may contain a mixture of the reference salts. In this model a test still gives a solid when its target ion is present in a mixture.

3 Propose a two-salt mixture from the reference list that fits the second unknown. Explain both results. [1]

Answer and work

4 What should a third test detect to distinguish the two chloride salts in the possible two-salt mixtures? Explain why. [1]

Answer and work