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QUIZ

Reactions in Aqueous Solution

1. Read the given chemical equation.

$2NaCl(aq) + Pb(NO_3)_2(aq) \rightarrow PbCl_2(s) + 2NaNO_3(aq)$

Which are spectator ions in the equation? Select all that apply.

A. Na^+

B. Pb^{2+}

C. Cl^-

D. NO_3^-

2. The complete ionic equation for the reaction between aqueous potassium chloride and silver nitrate is shown.

$Ag^+(aq) + NO_3^-(aq) + K^+(aq) + Cl^-(aq) \rightarrow AgCl(s) + K^+(aq) + NO_3^-(aq)$

Which set of ions and/or molecules will be part of the net ionic equation?

A. silver ions, potassium ions

B. silver ions, chloride ions, silver chloride

C. potassium ions, nitrate ions, silver chloride

D. potassium ions, silver ions, nitrate ions, chloride ions

3. An ionic compound is solvated in water. Choose the statements that are **true** about the solvation process. Select all that apply.

A. Water molecules surround individual ions.

B. The compound dissociated into its respective ions.

C. A strong ion-dipole interaction exists between the ion and water molecule.

D. Hydrogen bonds in water become stronger than ionic bonds in the compound.

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Use the table to answer the next two questions.
The general solubility rules of some ionic compounds are shown in the table.

Solubility Rules for Ionic Compounds		
Compounds	**Solubility**	**Exceptions**
Salts of alkali metals and ammonia	Soluble	Some lithium compounds
Nitrate salts and chlorate salts	Soluble	Few exceptions
Sulfate salts	Soluble	Compounds of Pb, Ag, Hg, Ba, Sr, and Ca
Chloride, iodide salts	Soluble	Compounds of Ag and some compounds of Hg and Pb
Carbonates, hosphates, chromates, sulfides, and hydroxides	Most are insoluble	Compounds of alkali metals and of ammonia

4. Based on the solubility rules, which pair of aqueous salt solutions are **most** likely to form a precipitate when mixed? Select all that apply.

A. KCl and NH_4NO_3
B. $CaCl_2$ and $MgSO_4$
C. $MgSO_4$ and $NaNO_3$
D. $NaCl$ and $AgNO_3$

5. A chemist at a remote testing laboratory with limited resources has to test water samples for suspected contamination in the region. The water sample has to be tested for the presence of lead ions and chloride ions. Trace amounts of lead are highly toxic and excessive chloride ions can be a cause of hypertension in humans. The chemist plans to use two aqueous salt solutions to test for the presence of these ions. Based on solubility rules, which set of respective aqueous solutions should be added to the contaminated water samples to test for the presence of lead ions and chloride ions?

A. potassium chlorate; sodium sulfate
B. potassium chlorate; silver nitrate
C. potassium iodide; sodium sulfate
D. potassium iodide; silver nitrate