

Year 11 Chemistry
Solubilities and Reactions
Formative Test

SOLUTIONS

1.

- | | |
|--------------------------------|-----------------------------------|
| (a) NiF ₂ soluble | (d) Ag ₂ S insoluble |
| (b) PbO ₂ insoluble | (e) Hg(OH) ₂ insoluble |
| (c) AuI ₂ soluble | (f) BaSO ₄ insoluble |

2.

- precipitate with hydroxide or carbonate – cannot be K, Na, NH₄
- soluble as sulphate – cannot be barium, strontium or lead
- soluble as oxide – must be calcium or barium

It is calcium.

3.

- (a) $\text{Mg}(\text{HCO}_3)_2(\text{s}) + 2\text{H}^+(\text{aq}) \rightarrow 2\text{H}_2\text{O}(\text{l}) + 2\text{CO}_2(\text{g}) + \text{Mg}^{2+}(\text{aq})$
- (b) $\text{Cl}_2(\text{g}) + 2\text{Na}(\text{s}) \rightarrow 2\text{NaCl}(\text{s})$
- (c) $\text{Zn}(\text{s}) + 2\text{H}^+(\text{aq}) \rightarrow \text{Zn}^{2+}(\text{aq}) + \text{H}_2(\text{g})$
- (d) $\text{CO}_3^{2-}(\text{aq}) + 2\text{H}^+(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l}) + \text{CO}_2(\text{g})$
- (e) $3\text{Ag}^+(\text{aq}) + \text{PO}_4^{3-}(\text{aq}) \rightarrow \text{Ag}_3\text{PO}_4(\text{s})$

4. The lump would dissolve and bubbles would form.

Bonus:

A) We write it like (i). The formula Cr₂(SO₄)₃ shows it is made up of three times as many sulfate ions as chromium ions. The ions do not form molecules when the substance dissolves.

B) NaCl is an ionic substance, so it already has ions that break apart in water. HCl is covalently bonded so its bond breaks and ions are formed.