SOLUTIONS

1.

(a) $NiO_{(s)}$
(b) $PbF_{2(s)}$
(c) $Co(OH)_{2(s)}$
(d) $NH_4Cl_{(aq)}$
(e) $KNO_{3(aq)}$
(f) $AgI_{(s)}$
(g) $AuS_{(s)}$
(h) $SnSO_{4(aq)}$
(i) $FeCO_{3(s)}$
(j) $K_3PO_{4(aq)}$
(k) $NaNO_{3(aq)}$
(l) $MgBr_{2(aq)}$

2. Barium. (Example reason: Soluble as an oxide, insoluble as a sulphate.)

3. (only the ionic equation is written below, the steps to get there are not)
(a) $Cl_{2(g)} + Ca_{(s)} \rightarrow CaCl_{2(s)}$ ($CaCl_2$ is soluble but it's not in water here so it's solid)
(b) $PbCO_{3(s)} + 2H^+_{(aq)} + 2Cl^-_{(aq)} \rightarrow PbCl_{2(s)} + CO_{2(g)} + H_2O_{(l)}$
(c) $Mg(HCO_3)_{2(s)} + 2H^+_{(aq)} \rightarrow Mg^{2+}_{(aq)} + CO_{2(g)} + 2H_2O_{(l)}$
(d) $Mg_{(s)} + Cu^{2+}_{(aq)} \rightarrow Mg^{2+}_{(aq)} + Cu_{(s)}$
(e) No reaction (sodium is more reactive than zinc)
(f) No reaction (everything is aq on both sides)
(g) $H^+_{(aq)} + OH^-_{(aq)} \rightarrow H_2O_{(l)}$
(h) $2H^+_{(aq)} \rightarrow H_{2(g)}$
(i) $2Li_{(s)} + H_2O_{(l)} \rightarrow Li_2O_{(aq)} + H_{2(g)}$
(j) $C_3H_{8\,(g)} + 5O_{2\,(g)} \rightarrow 3CO_{2\,(g)} + 4H_2O_{(l)}$