

a)

Word equation	iron + sulfur → iron(II) sulfide
Balanced equation	$8\text{Fe}_{(s)} + \text{S}_{8(s)} \rightarrow 8\text{FeS}_{(s)}$ <p style="text-align: right;">FORMATION</p>

b)

Word equation	calcium + oxygen gas → calcium oxide
Balanced equation	$2\text{Ca}_{(s)} + \text{O}_{2(g)} \rightarrow 2\text{CaO}_{(s)}$ <p style="text-align: right;">← not on solubility chart FORMATION</p>

c)

Word equation	calcium oxide + carbon dioxide → calcium carbonate									
Balanced equation	$\text{CaO}_{(s)} + \text{CO}_{2(g)} \rightarrow \text{CaCO}_{3(s)}$ <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Ca - 1</td> <td style="border-left: 1px solid black; padding-left: 10px;"></td> <td style="text-align: center;">Ca - 1</td> </tr> <tr> <td style="text-align: center;">O - 3</td> <td style="border-left: 1px solid black; padding-left: 10px;"></td> <td style="text-align: center;">O - 3</td> </tr> <tr> <td style="text-align: center;">C - 1</td> <td style="border-left: 1px solid black; padding-left: 10px;"></td> <td style="text-align: center;">C - 1</td> </tr> </table> <p style="text-align: right;">FORMATION</p>	Ca - 1		Ca - 1	O - 3		O - 3	C - 1		C - 1
Ca - 1		Ca - 1								
O - 3		O - 3								
C - 1		C - 1								

d)

Word equation	copper(II) oxide → copper + oxygen gas
Balanced equation	$2\text{CuO}_{(s)} \rightarrow 2\text{Cu}_{(s)} + \text{O}_{2(g)}$ <p style="text-align: center;">↑ not on solubility chart</p> <p style="text-align: right;">Decomposition</p>

e)

Word equation	water → hydrogen gas + oxygen gas
Balanced equation	$2 \text{H}_2\text{O}(\text{l}) \rightarrow 2 \text{H}_2(\text{g}) + \text{O}_2(\text{g})$ <p style="text-align: right;">Decomposition</p>

f)

Word equation	potassium + water → potassium hydroxide + hydrogen gas						
Balanced equation	$2 \text{K}(\text{s}) + 2 \text{H}_2\text{O}(\text{l}) \rightarrow 2 \text{KOH}(\text{aq}) + \text{H}_2(\text{g})$ <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">K - +2</td> <td style="border-left: 1px solid black; padding-left: 10px; text-align: center;">K - +2</td> </tr> <tr> <td style="text-align: center;">H - +2</td> <td style="border-left: 1px solid black; padding-left: 10px; text-align: center;">H - 2</td> </tr> <tr> <td style="text-align: center;">OH - +2</td> <td style="border-left: 1px solid black; padding-left: 10px; text-align: center;">OH - +2</td> </tr> </table> <p style="text-align: right;">SR</p>	K - +2	K - +2	H - +2	H - 2	OH - +2	OH - +2
K - +2	K - +2						
H - +2	H - 2						
OH - +2	OH - +2						

g)

Word equation	zinc + tin(II) chloride → zinc chloride + tin $\text{Sn}^{2+} \quad \text{Cl}^- \quad \text{Zn}^{2+} \quad \text{Cl}^-$
Balanced equation	$\text{Zn}(\text{s}) + \text{SnCl}_2(\text{aq}) \rightarrow \text{ZnCl}_2(\text{aq}) + \text{Sn}(\text{s})$ <p style="text-align: right;">SR</p>

h)

Word equation	copper + silver nitrate → copper(II) nitrate + silver						
Balanced equation	$\text{Cu}(\text{s}) + 2 \text{AgNO}_3(\text{aq}) \rightarrow \text{Cu}(\text{NO}_3)_2(\text{aq}) + 2 \text{Ag}(\text{s})$ <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Cu - 1</td> <td style="border-left: 1px solid black; padding-left: 10px; text-align: center;">Cu - 1</td> </tr> <tr> <td style="text-align: center;">Ag - +2</td> <td style="border-left: 1px solid black; padding-left: 10px; text-align: center;">Ag - +2</td> </tr> <tr> <td style="text-align: center;">NO₃ - +2</td> <td style="border-left: 1px solid black; padding-left: 10px; text-align: center;">NO₃ - 2</td> </tr> </table> <p style="text-align: right;">SR</p>	Cu - 1	Cu - 1	Ag - +2	Ag - +2	NO ₃ - +2	NO ₃ - 2
Cu - 1	Cu - 1						
Ag - +2	Ag - +2						
NO ₃ - +2	NO ₃ - 2						

i)

Word equation	potassium iodide + lead(II) nitrate → potassium nitrate + lead(II) iodide								
Balanced equation	$2 \text{KI}_{(aq)} + \text{Pb}(\text{NO}_3)_2_{(aq)} \rightarrow 2 \text{KNO}_3_{(aq)} + \text{PbI}_2_{(s)}$ <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="padding: 0 10px;">K + 2</td> <td style="border-left: 1px solid black; padding: 0 10px;">K - 2</td> </tr> <tr> <td style="padding: 0 10px;">I - 2</td> <td style="border-left: 1px solid black; padding: 0 10px;">I - 2</td> </tr> <tr> <td style="padding: 0 10px;">Pb - 1</td> <td style="border-left: 1px solid black; padding: 0 10px;">Pb - 1</td> </tr> <tr> <td style="padding: 0 10px;">NO₃ - 2</td> <td style="border-left: 1px solid black; padding: 0 10px;">NO₃ - 2</td> </tr> </table>	K + 2	K - 2	I - 2	I - 2	Pb - 1	Pb - 1	NO ₃ - 2	NO ₃ - 2
K + 2	K - 2								
I - 2	I - 2								
Pb - 1	Pb - 1								
NO ₃ - 2	NO ₃ - 2								

(DR)

j)

Word equation	sodium chloride + silver nitrate → sodium nitrate + silver chloride
Balanced equation	$\text{NaCl}_{(aq)} + \text{AgNO}_3_{(aq)} \rightarrow \text{NaNO}_3_{(aq)} + \text{AgCl}_{(aq)}$

(PR)

k)

Word equation	barium chloride + potassium sulfate → barium sulfate + potassium chloride								
Balanced equation	$\text{BaCl}_2_{(aq)} + \text{K}_2\text{SO}_4_{(aq)} \rightarrow \text{BaSO}_4_{(s)} + 2\text{KCl}_{(aq)}$ <table style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="padding: 0 10px;">Ba - 1</td> <td style="border-left: 1px solid black; padding: 0 10px;">Ba - 1</td> </tr> <tr> <td style="padding: 0 10px;">Cl - 2</td> <td style="border-left: 1px solid black; padding: 0 10px;">Cl - 2</td> </tr> <tr> <td style="padding: 0 10px;">K - 2</td> <td style="border-left: 1px solid black; padding: 0 10px;">K - 2</td> </tr> <tr> <td style="padding: 0 10px;">SO₄ - 1</td> <td style="border-left: 1px solid black; padding: 0 10px;">SO₄ - 1</td> </tr> </table>	Ba - 1	Ba - 1	Cl - 2	Cl - 2	K - 2	K - 2	SO ₄ - 1	SO ₄ - 1
Ba - 1	Ba - 1								
Cl - 2	Cl - 2								
K - 2	K - 2								
SO ₄ - 1	SO ₄ - 1								

(DR)