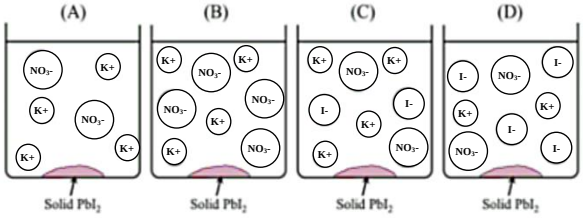
Dougherty Valley HS Chemistry - AP
Solutions – Net Ionic and Particle Diagrams

Worksheet #6

Name: **Period:** **Seat#:**

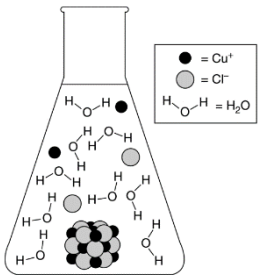
Conceptual Questions

1) A student mixes a solution of $Pb(NO_3)_2(aq)$ with an excess amount of KI(aq). A precipitate of $PbI_2(s)$ is formed. Which of the following particle diagrams accurately represents the major ionic species remaining in the solution after the reaction has been completed?



2) The particle diagram shown represents the dissolution of CuCl(s) assuming an equilibrium concentration for Cu^+ ions of about 4×10^{-4} M in a saturated solution at 25°C. The equilibrium being represented is shown in the following chemical equation: $CuCl(s) \leftrightarrow Cu^+(aq) + Cl^-(aq)$ Which of the following changes to the particle diagram will best represent the effect of adding 1.0 mL of 4M NaCl to the solution?

A) Some of the Cu^+ and Cl^- ions combine to form CuCl(s) because the K_{sp} will be lower than 1.6×10^{-7}
B) Some of the Cu^+ and Cl^- ions combine to form CuCl(s) because the molar solubility will be lower than 4×10^{-4} M
C) More Cu^+ and Cl^- ions will be in solution because the molar solubility will be higher than 4×10^{-4} M
D) More Cu^+ and Cl^- ions will be in solution because the K_{sp} will be higher than 1.6×10^{-7}.

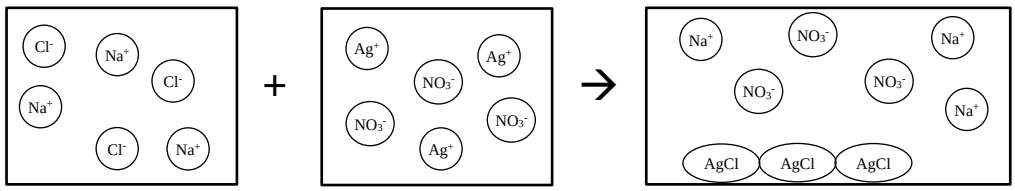


Net Ionic and Particle Diagram Questions: For the following reactions below write/draw:

a) Balanced equation (make sure to predict the products and write good neutral formulas! WITH PHASES!)
b) Balanced ionic equation (if applicable)
c) Balanced net ionic equation (if applicable)
d) Particle diagram (make sure to show the spectator ions that are in solution. If you are told a concentration, then have each circle represent one mole of the substance. Make sure the placement of the particles is representative of the phase that they are in.)

Example: 3.0 M aqueous sodium chloride and 3.0 aqueous silver nitrate will combine to produce...

a) $NaCl(aq) + AgNO_3(aq) \rightarrow NaNO_3(aq) + AgCl(s)$
b) $Na^+(aq) + Cl^-(aq) + Ag^+(aq) + NO_3^-(aq) \rightarrow Na^+(aq) + NO_3^-(aq) + AgCl(s)$
c) $Cl^-(aq) + Ag^+(aq) \rightarrow AgCl(s)$
d)



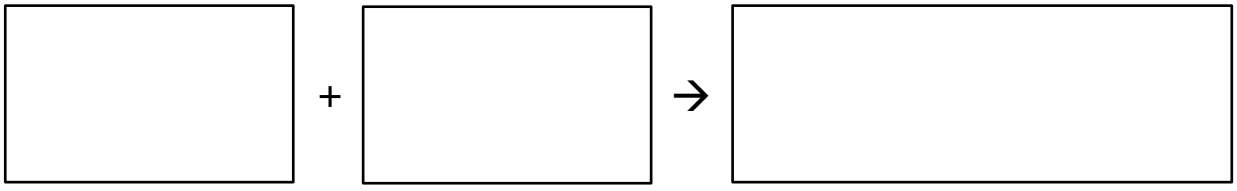
3) 2.0 M potassium sulfide reacts with 2.0 M calcium chloride.

a)

b)

c)

d)



4) 1.0 M ammonium bromide reacts with 2.0 M silver nitrate.

a)

b)

c)

d) [ ] + [ ] → [ ]

5) 2.0 M carbon monoxide and 2.0 M diatomic oxygen combine to form carbon dioxide

a)

b)

c)

d) [ ] + [ ] → [ ]

6) Calcium iodide reacts with ammonium carbonate.

a)

b)

c)

d) [ ] + [ ] → [ ]

7) Silver chloride and a 2nd product is produced when starting with silver nitrate and a calcium containing compound.

a)

b)

c)

d) [ ] + [ ] → [ ]

Net Ionic Questions: For the following reactions below write/draw:

a) Balanced equation (make sure to predict the products and write good neutral formulas! WITH PHASES!)
b) Balanced ionic equation (if applicable)
c) Balanced net ionic equation (if applicable)
d) Particle diagram is optional if you feel like you need more practice than go ahead and draw some! 😊

8) _____$Al(s)$ + _____$Pb(NO_3)_2(aq)$ →

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9) _____$Cl_2(g)$ + _____$NaBr(aq)$ →

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10) _____$Na(s)$ + _____$H_2O(l)$ →

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11) _____$Ag(s)$ + _____$Fe(C_2H_3O_2)_2$ →

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12) _____$Cd_3(PO_4)_{2(aq)}$ + _____ $(NH_4)_2S_{(aq)}$ →

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13) A solution of silver nitrate with a solution of potassium chloride →

14) _____$Na_2CO_{3(aq)}$ + _____$H_2SO_{4(aq)}$ → _____ H_2O + _____ CO_2 +

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15) _____$Al_2(SO_4)_{3(aq)}$ + _____$Ca_3(PO_4)_{2(aq)}$ →

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16) Silver acetate plus potassium chromate →

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17) A solution of ammonium carbonate is mixed with a solution of calcium acetate

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18) A solution of sodium chromate is mixed with a solution of barium sulfate