Iron(III) oxide reacts with carbon monoxide to produce iron and carbon dioxide.
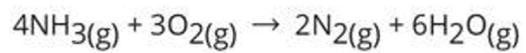
$Fe_2O_{3(s)} + 3CO_{(g)} \rightarrow 2Fe_{(s)} + 3CO_{2(g)}$
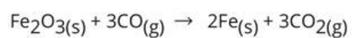
What is the percent yield of iron if the reaction of 65.0 g of iron(III) oxide produces 15.0 g of iron?

○ 0.96 g of Fe.

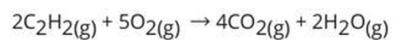○ 68.9 g of Fe.

○ 45.9 g of Fe.

○ 0.29 g of Fe.

Ammonia and oxygen react to form nitrogen and water.

$$4NH_{3(g)} + 3O_{2(g)} \rightarrow 2N_{2(g)} + 6H_2O_{(g)}$$

How many grams of O_2 are needed to react with 9.5 g of NH_3?

In the acetylene torch, acetylene gas (C_2H_2) burns in oxygen to produce carbon dioxide, water, and energy.

$$2C_2H_{2(g)} + 5O_{2(g)} \rightarrow 4CO_{2(g)} + 2H_2O_{(g)}$$

How many moles of C_2H_2 are required to produce 0.50 mol of CO_2?

○ 6.50 mol of C_2H_2

○ 0.25 mol of C_2H_2

○ 0.75 mol of C_2H_2

○ 1.00 mol of C_2H_2

Hydrogen sulfide burns with oxygen to give sulfur dioxide and water. In a reaction of **8.52 g** of **H_2S** and **9.60 g** of **O_2**.

$$H_2S_{(g)} + O_{2(g)} \rightarrow SO_{2(g)} + H_2O_{(g)}$$
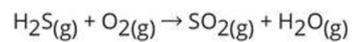
a. Find the limiting reagent.

b. Calculate the mass of SO_2 produced.

c. How much of excess reagent is left at the end of the reaction?

Calculate the mass in grams needed to make 2.50×10^2 mL of a 0.100 M $KMnO_4$ solution.

The spectator ions for the reaction of $Na_2S_{(aq)}$ and $PbNO_{3(aq)}$ is

Calculate the volume in mL of a solution required to provide 0.85 g of acetic acid (CH_3COOH) from a 0.30 M solution.

Which of the following will likely result in a perecipitaion reaction?

○ Mixing of $NH_4Cl_{(aq)}$ with $K_3PO_{4(aq)}$

○ Mixing of $BaCl_{2(aq)}$ with $K_2SO_{4(aq)}$

○ Mixing of $NaClO_{4(aq)}$ with $Ca(HCO_3)_{2(aq)}$

○ Mixing of $NaNO_{3(aq)}$ with $CuSO_{4(aq)}$

Calculate the molarity of 85 mL solution containing 0.32 moles of NaCl solution.

Which of the following solutions, when added to a solution of Na_2SO_4 would form a precipitate?

I. $AgNO_{3(aq)}$ II. $KNO_{3(aq)}$ III. $CaCl_{2\ (aq)}$

○ II only.

○ I and II only.

○ III only.

○ I and III only

The volume, in milliliters, of a 0.215 M NaOH solution that will completely neutralize 3.80 mL of a 1.25 M HNO_3 solution is
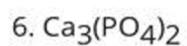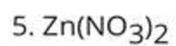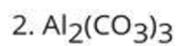
○ 7.07 mL.

○ 22.09 mL.

○ 38 mL.

○ 12.50 mL.

The oxidation number of S in HSO_4^- and H_2SO_3 is

Identify the following compounds as soluble or insoluble.

1. $AgClO_3$

2. $Al_2(CO_3)_3$

3. NiS

4. $CuSO_4$

5. $Zn(NO_3)_2$

6. $Ca_3(PO_4)_2$

The reducing agent in the following reaction is

$$Cl_{2(g)} + 2NaBr_{(aq)} \rightarrow 2NaCl_{(aq)} + Br_{2(l)}$$
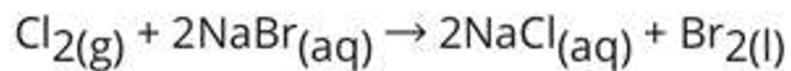
The substance reduced in the following reaction is

$$Fe_{(s)} + CuSO_{4(aq)} \rightarrow Cu_{(s)} + FeSO_{4(aq)}$$
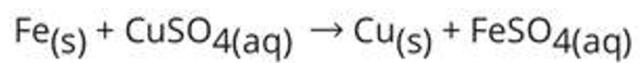
The correct net ionic equation for the reaction that occurs between $K_3PO_{4(aq)}$ and $Sr(NO_3)_2$ is

○ $Sr^{2+}_{(aq)} + 6NO_3^-_{(aq)} \rightarrow Sr(NO_3)_{2(aq)}$

○ $6K^+_{(aq)} + 6NO_3^-_{(aq)} \rightarrow KNO_{3(aq)}$

○ $Sr^{2+}_{(aq)} + 2PO_4^{3-}_{(aq)} \rightarrow Sr_3(PO_4)_{2(s)}$

○ $3K^+_{(aq)} + 2PO_4^{3-}_{(aq)} \rightarrow K_3PO_{4(aq)}$

The oxidizing reagent in the following reaction is

$$2Al_{(s)} + 3Sn^{2+}_{(aq)} \rightarrow 2Al^{3+}_{(aq)} + 3Sn_{(s)}$$
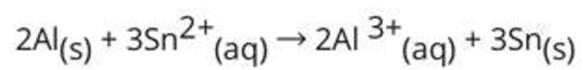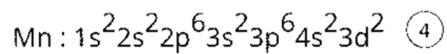
Which of the following is an insoluble compound of Mg is

○ $MgClO_3$

○ $MgNO_3$

○ $MgSO_4$

○ $MgCO_3$

The substance oxidized in the following reaction is

$Cl_{2(g)} + 2KI_{(aq)} \rightarrow I_{2(s)} + 2KCl_{(aq)}$
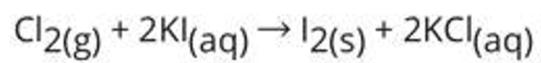
Which of the following has a correct pair of electron configuration?

Zn : [Ar] $4s^2 3d^8$ (1)

P^{3-} : $1s^2 2s^2 2p^6 3s^2 3p^6$ (2)

Al: $1s^2 2s^2 2p^4 3s^2 3p^3$ (3)

Mn : $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^2$ (4)
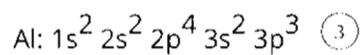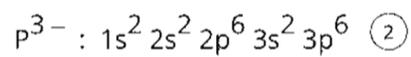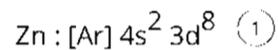
$1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^2\ 3d^8$ is the electronic configuration of

Fe ①

Zn ②

Mn ③

Ni ④

Which of the following orbitals has the lowest energy?

3d ①

4p ②

4s ③

3p ④

"No two electrons in an atom can have the same four quantum numbers" is a statement of

Pauli exclusion principle. (1)

None of the above. (2)

Hund's rule. (3)

Aufbau rule. (4)