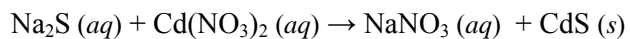
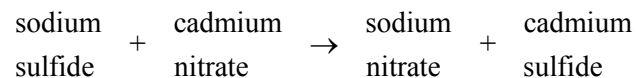
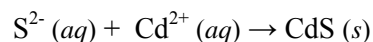


### Exchange Reactions

#### Exchange Example 1: Adding together solutions of sodium sulfide & cadmium nitrate

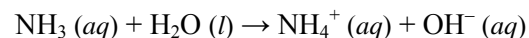


Net ionic reaction:

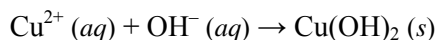


#### Exchange Example 2: Add ammonia to a solution of copper (II) nitrate

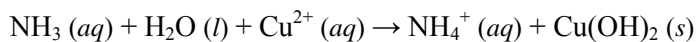
Step 1: ammonia reacts with water (ammonia is a weak base)



Step 2: copper (II) ions react with hydroxide ions

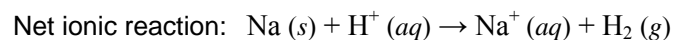
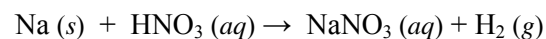
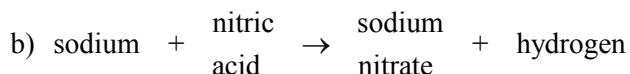
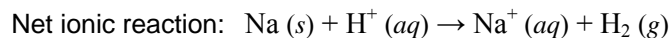
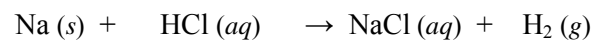
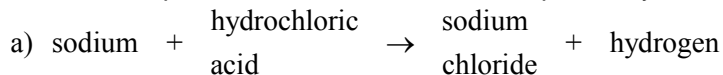


Overall reaction:

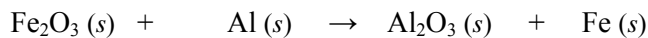
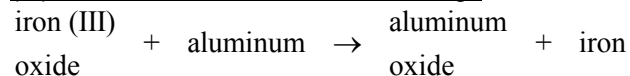


### Redox Reactions

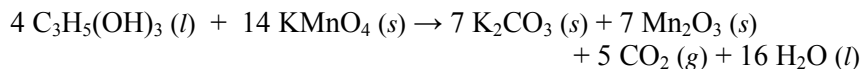
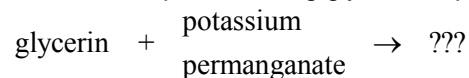
#### Redox Example 1: Sodium metal added to aqueous hydrochloric acid



#### Redox Example 2: Heating to initiate a reaction between powdered iron (III) oxide and aluminum metal shavings



#### Redox Example 3: Adding glycerin to potassium permanganate crystals



Take-home lessons:

1) How are exchange reactions and redox reactions similar?

2) How are exchange reactions and redox reactions different?