

Chemistry in Society

Worksheet 5 REDOX



1. The highest oxidation state of chlorine is present in:

A HClO

B HClO2

C HClO3

D HClO4

1. Determine the oxidation number of the elements in each of the following compounds:  
     
   a. H2CO3

b. N2   
  
  
c. Zn(OH)42-   
  
  
d. NO2-   
  
  
e. LiH 

1. Identify the species being oxidized and reduced in each of the following reactions:   
     
   a. Cr+ + Sn4+ http://www.chemistry.wustl.edu/~coursedev/Online%20tutorials/arrow.gif Cr3+ + Sn2+   
     
     
     
   b. 3 Hg2+ + 2 Fe (s) http://www.chemistry.wustl.edu/~coursedev/Online%20tutorials/arrow.gif 3 Hg + 2 Fe3+   
     
     
     
     
   c. 2 As (s) + 3 Cl2 (g) http://www.chemistry.wustl.edu/~coursedev/Online%20tutorials/arrow.gif 2 AsCl3
2. Correctly identify which reagent is being oxidised and which is being reduced in the following reaction.   
     
     
   Show answer through writing out half-reactions including electrons.
3. Ammonia reacts with magnesium as shown.

3Mg(s) +2NH3(g) ⭢ (Mg2+)3(N3-)2(s) + 3H2(g)

In this reaction, ammonia is acting as:

A a reducing agent

B an oxidising agent

C a base

D an acid

1. State the substance that is the oxidising agent and which is the reducing agent in the following reaction:  
     
   Mn + Pb(NO3)2 🡪 Mn(NO3)2 + Pb
2. During a redox process in acid solution, iodate ions, IO3 − (aq), are converted into iodine, I2(aq).   
     
    IO3 − (aq) → I2(aq)   
     
   The numbers of H+ (aq) and H2O(l) required to balance the ion-electron equation for the formation of I2(aq) are, respectively   
     
   A 3 and 6   
   B 6 and 3   
   C 6 and 12   
   D 12 and 6.

1. During a redox process in acid solution, nitrate ions, NO3-(aq), are converted into nitrite ions, NO2-(aq).

NO3- (aq) ⭢ NO2- (aq)

The numbers of H+(aq) and H2O(l) required to balance the ion-electron equation for the formation of 1 mol of NO2-(aq) are, respectively

A 2 and 1

B 1 and 3

C 1 and 1

D 3 and 2

1. Balance the full redox equation:  
     
    ClO3- + I2 🡪 Cl- + IO3- Acid Conditions

1. Balance the full redox equation:   
     
   Cr(OH)3 + Br2 http://www.chemistry.wustl.edu/~coursedev/Online%20tutorials/arrow.gif CrO42- + Br- in basic solution