

Unit 6: Redox Reactions and Electrochemistry

Practice Set 1: Oxidation Numbers and Redox Reactions

1. Determine the oxidation number of each element in the following compounds.

- Rules:**
- Pure elements have an oxidation number of 0
 - If the compound is an ionic compound, the oxidation number for each element is the ion's charge
 - The oxidation number of hydrogen in a compound is +1
 - The oxidation number of oxygen in most compounds is -2 (peroxides are the exception; in peroxides oxygen has an oxidation number of -1)
 - The sum of the oxidation numbers in a compound is zero.
 - The sum of the oxidation numbers in a polyatomic ion is equal to the ion charge.

	Hint	Oxidation Numbers for each Element			
a. SnCl_4	Rule 2	Sn _____	Cl _____		
b. Ca_3P_2	Rule 2	Ca _____	P _____		
c. SnO	Rules 4, 5	Sn _____	O _____		
d. Ag_2S	Rule 2	Ag _____	S _____		
e. HI	Rule 3, 5	H _____	I _____		
f. N_2H_4	Rule 3, 5	N _____	H _____		
g. Al_2O_3	Rule 4, 5	Al _____	O _____		
h. S_8	Rule 1	S _____			
i. HNO_2	Rules 3, 4, 5	H _____	N _____	O _____	
j. O_2	Rule 1	O _____			
k. H_3O^+	Rules 3, 4, 6	H _____	O _____		
l. ClO_3^-	Rules 4, 6	Cl _____	O _____		
m. $\text{S}_2\text{O}_3^{2-}$	Rules 4, 6	S _____	O _____		
n. KMnO_4	Rules 4, 5, 6	K _____	Mn _____	O _____	
o. $(\text{NH}_4)_2\text{SO}_4$	Rules 4, 5, 6	N _____	H _____	S _____	O _____

2. Determine the oxidation number of carbon in each of the following compounds:

a. methane, CH_4

b. formaldehyde, CH_2O

c. carbon monoxide, CO

d. carbon dioxide, CO_2