



- Give the oxidation number of the following ions:  
 a.  $\text{H}^+$    b.  $\text{Cl}^-$    c.  $\text{Ag}^+$    d.  $\text{S}^{2-}$    e.  $\text{Mg}^{2+}$    f.  $\text{Mn}^{4+}$    g.  $\text{Sr}^{2+}$    h.  $\text{Al}^{3+}$    i.  $\text{K}^+$    j.  $\text{F}^-$
- By referring to your periodic table, predict the oxidation number of these elements when they form ions:  
 a. I   b. Sn   c. C   d. Li   e. B   f. O   g. Ba   h. Rb   i. Si   j. Br   k. Be
- Examine each of the following reactions and decide which are 'redox' reactions. Explain your choice:
  - $\text{Cu}_{(s)} + \text{Cl}_{2(g)} \rightarrow \text{CuCl}_{2(s)}$
  - $\text{NaOH}_{(aq)} + \text{HNO}_{3(aq)} \rightarrow \text{NaNO}_{3(aq)} + \text{H}_2\text{O}_{(l)}$
  - $\text{MnO}_{2(s)} + 4\text{HCl}_{(aq)} \rightarrow \text{MnCl}_{2(aq)} + 2\text{H}_2\text{O}_{(l)} + \text{Cl}_{2(aq)}$
  - $\text{CuO}_{(s)} + \text{H}_2\text{SO}_{4(l)} \rightarrow \text{CuSO}_{4(aq)} + \text{H}_2\text{O}_{(l)}$
  - $2\text{C}_2\text{H}_{2(g)} + 5\text{O}_{2(g)} \rightarrow 4\text{CO}_{2(g)} + 2\text{H}_2\text{O}_{(g)}$
- Work out the oxidation number of the first element in each of the following compounds:  
 a.  $\text{PbO}_2$    b.  $\text{ZnO}$    c.  $\text{SF}_6$    d.  $\text{Fe}_2\text{O}_3$    e.  $\text{MnO}$    f.  $\text{Cr}(\text{NO}_3)_3$    g.  $\text{NiCO}_3$   
 h.  $\text{PCl}_3$    i.  $\text{Cu}_2\text{SO}_4$    j.  $\text{V}_2\text{O}_5$    k.  $\text{N}_2\text{O}$    l.  $\text{FeS}$    m.  $\text{SiCl}_4$    n.  $\text{Hg}_2\text{S}$
- There are 3 metals in the above problems that showed *variable valency* (or more than one oxidation number other than zero). Find them and give their oxidation states. Where are they positioned in the periodic table?
- Complete these sentences:  
 Oxidation is \_\_\_\_\_ of electrons, while \_\_\_\_\_ is gain (OILRIG). When carbon is burnt in oxygen, the carbon is \_\_\_\_\_ and the oxygen is \_\_\_\_\_.  
 Carbon's O.N. (oxidation number) changes from \_\_\_\_\_ to \_\_\_\_\_, while oxygen's changes from \_\_\_\_\_ to \_\_\_\_\_. Because oxygen is doing the oxidizing, we call it the \_\_\_\_\_ agent. Carbon is therefore the \_\_\_\_\_ agent.