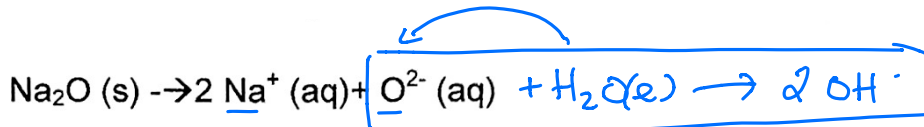


Chemistry 12
ACID BASE PART II Lesson #21
Metal and Non-Metal Oxides

When a metal oxide is added to water there is an initial dissociation reaction, such as:



The O^{2-} present in water reacts to form OH^- as seen in the above example:

The OH^- is strongly attracted to the Na^+ that is present and forms NaOH .

The overall balanced equation is:



Example 1. Write out the balanced equations for the following metal oxides in water:

- a. $\text{SrO} + \text{H}_2\text{O(l)} \rightarrow \text{Sr(OH)}_2 \text{(aq)}$
- b. $\text{Rb}_2\text{O} + \text{H}_2\text{O(l)} \rightarrow 2 \text{RbOH (aq)}$
- c. $\text{CaO} + \text{H}_2\text{O(l)} \rightarrow \text{Ca(OH)}_2 \text{(aq)}$

CONCLUSION: METAL OXIDES FORM Basic aqueous SOLUTIONS!!!!

When a non-metal oxide is added to water bonds to the existing oxide portion of the molecule to create an acid.

Example: $\text{SO}_3 + \text{H}_2\text{O} \rightarrow \text{H}_2\text{SO}_4$ (synthesis)

Example 2. Write out the balanced equations for the following non-metal oxides in water:

- a. $\text{CO}_2 + \text{H}_2\text{O(l)} \rightarrow \text{H}_2\text{CO}_3 \text{(aq)}$ ← normal rain
 - b. $\text{N}_2\text{O}_5 + \text{H}_2\text{O(l)} \rightarrow 2 \text{HNO}_3 \text{(aq)}$
 - c. $\text{SO}_2 + \text{H}_2\text{O(l)} \rightarrow \text{H}_2\text{SO}_3 \text{(aq)}$
- (b and c are grouped together with a bracket and labeled "acid rain")*

CONCLUSION: NON-METAL OXIDES FORM acidic aqueous SOLUTIONS!!

TRENDS in P.T → more metallic ... more basic
 more non-metallic ... more acidic

SEATWORK/HOMEWORK: Exercises 144-145 pg 185 in HEBDEN

PLO's: R1