Acid Formation Formulas

Sulfuric Acid from Sulfur Dioxide

$$SO_2 + O_2 \rightarrow SO_3 + H_2O \rightarrow H_2SO_4 + H_2O \rightarrow SO_4 + H_3O$$

Nitric Acid from Nitrogen Oxides

NO or NO₂ or N₂O + O₂
$$\rightarrow$$
 NO₃ + H₂O \rightarrow HNO₃ + H₂O \rightarrow NO₃ + H₃O

Carbonic Acid from Carbon Dioxide

$$CO_2 + H_2O \rightarrow HCO_3$$

Example of 'buffering' of acid rain by alkaline (basic) rocks, such as limestone (main component of limestone is calcium carbonate)

$$CaCO_3 + H_2SO_4 \rightarrow CaSO_4 (s) + H_2O (l) + CO_2 (g)$$