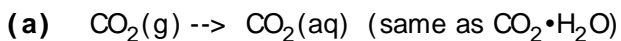
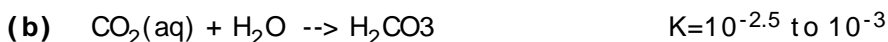


Speciation of inorganic carbon in aqueous solution

CO₂ dissolves in water:



Dissolved CO₂ and water react to form carbonic acid:



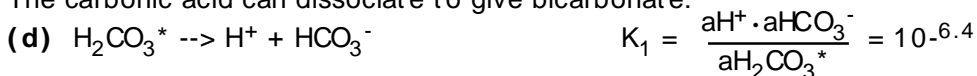
The small value of K means that equilibrium is far to the left in Reaction b. Thus most CO₂(aq) stays as CO₂(aq) - most remains as the hydrated linear CO₂ molecule (see below) rather than becoming a planar triangular CO₃²⁻ ion complexed with two H⁺s. Most geochemists simplify by lumping the hydrated CO₂ and the true H₂CO₃ as H₂CO₃^{*}:

$$[H_2CO_3^*] = [CO_2(aq)] + [H_2CO_3]$$

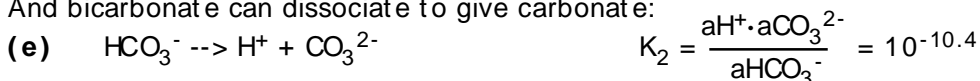
Thus we usually write a third equation that combines (a) and (b):



The carbonic acid can dissociate to give bicarbonate:



And bicarbonate can dissociate to give carbonate:



The presence of H⁺ as a product in d and e means that both reactions proceed to the right much more at higher pH.

