Answer on Question #65481 - Chemistry - Inorganic Chemistry

The next three (3) problems deal with the titration of 541 mL of 0.501 M carbonic acid (H_2CO_3) ($K_{a1} = 4.3 \times 10^{-7}$, $K_{a2} = 5.6 \times 10^{-11}$) with 1.5 M KOH.

3. How many mL of the 1.5 M KOH are needed to raise the pH of the original carbonic acid solution to a pH of 6.755? Give your answer to one decimal place.

Solution:

We find the concentration of carbonic acid:

$c = n/V = 0.501/0.541 = 0.93$

We find the pH of carbonic acid solution:

Using the law of mass action:

$4.3 \cdot 10^{-7} = x^2/(0.93-x)$

$x = 0.00063$

$pH = -\lg(x) = 3.2$

Answer provided by https://www.AssignmentExpert.com