Answer on Question #80138 - Chemistry - Physical Chemistry

Question:

Find the concentrations of [H]+,hco3-,and co3-2 in a 0.01m solution of carbonic acid if the ph of solution is 4.18.[k1=4.45*10^-7 k2=4.69*10^-11]

Solution:

H2CO3 = H+ + HCO3- , K1;

HCO3- = H+ + CO32- , K2;

[HCO3-] = sqrt(K1*C(H2CO3) = (4.45*10^-7*0.01)^1/2 = (4.45*10^-9)^1/2 = 6.67*10^-5 M;

[H+]1 = [HCO3-] = 6.67*10^-5 M;

[CO3-2] = sqrt(K2*C(HCO3-) = (4.69*10^-11*6.67*10^-5)^1/2 = (3.13*10^-15)^1/2 = 5.59*10^-8 M;

[H+]2 = [CO3-2] = 5.59*10^-8 M;

[H+]total = [H+]1 + [H]2 = 6.68*10^-5 M;

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