Question #61566 – Chemistry – Organic Chemistry

2. What would be the equilibrium pH if 200 milligrams of Hydrofluoric acid (HF) were dissolved in 1 liter of solution? The pKa for the acid is equal to 3.2. (Hint: Convert pKa to Ka)

Solution:

HF <---> H+ + F-

$[H^+]=[F^-]+[OH^-]$

$C_{HF}=[HF]+[F^-]$

$K_a=[H+][F^-]/[HF]$

$[H^+]=K_aC_{HF}/(H^++K_a)+K_W/[H^+]$

$C_{HF}=0.2/(20*1)=0.01$ mol/l

$K_a=10^{-3.2}=6.3*10^{-4}$

$[H^+]=0.00222$ mol/l

pH=2.65

Answer: pH=2.65