Answer on Question #67224, Chemistry / General Chemistry

Determine the pH of a 0.100 M solution of sulfuric acid, H2SO4. Remember that only the first proton of H2SO4 is truly a strong acid, while the second proton has an acid equilibrium constant Ka2=0.012.

H2SO4(aq) + H2O(l) <---> HSO4^-(aq) + H3O^+ Ka1=infinity

HSO4^-(aq) + H2O(l) <---> SO4^2-(aq) + H3O^+(aq) Ka2=0.012

Answer

$H_2SO_4 \rightarrow H^+ + HSO_4$

$[H^+]=C=0.1 Mol/L$

$HSO_4^- \rightarrow H^+ + SO_4^{2-}$

$đ=\sqrt{0.\frac{012}{0}.1}=0.346$

$[H^+]=Cđ*N=0.1*0.346*1=0.0346 mol/L$

$[H^+]=0.1+0.0346=0.1346 MOL/l$

$pH=-lg[H^+]=-lg0.1346=0.87$