

Buffer/Titration/ K_a Challenge Problem

An unknown student in an unknown city in an unknown school titrates an unknown amount of weak acid dissolved in an unknown amount of water with a strong base of unknown concentration. After adding 20.00 mL of strong base, the pH is 5.00. The student continues the titration, reaching the equivalence point after 26.00 mL base is added. What is K_a for the acid? *[Hint: what is A^-/HA when $pH = 5.00$?]*

[Answer: 3.3×10^{-5}]