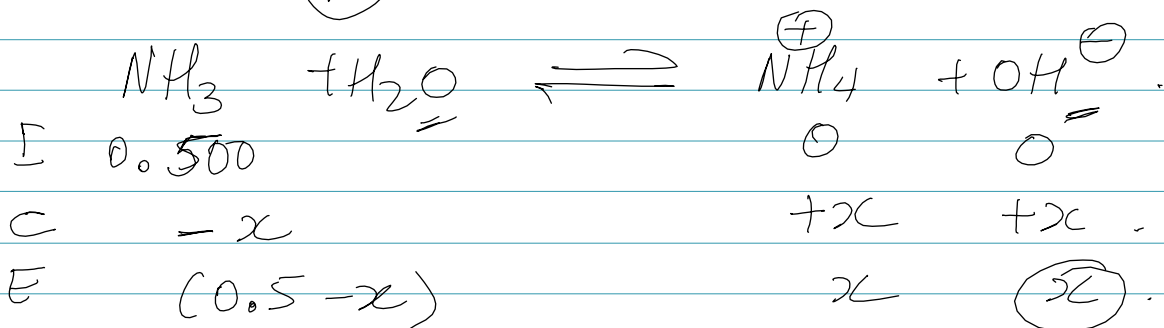


Symfony

Acid-base eq (3) Calculating pH of Base -

* Calculate the pH of 0.500 M NH₃. K_b = 1.8 × 10⁻⁵.



$$K_b = \frac{(x)(x)}{(0.5-x)}$$

ignore x

Quick check for x.

$$\frac{0.5}{1.8 \times 10^{-5}} = 2.8 \times 10^4 \gg 100$$

ignore x

$$1.8 \times 10^{-5} = \frac{x^2}{0.5}$$

take square root of both sides

$$(1.8 \times 10^{-5})(0.5) = x^2$$

$$\sqrt{9.0 \times 10^{-6}} = x$$

$$x = 3.0 \times 10^{-3} \text{ M} \equiv [\text{OH}^-]$$

$$pOH = -\log 3.0 \times 10^{-3} = 2.52$$

$$pH = 14 - 2.52 = 11.48$$

$$\boxed{11.5}$$