Exercise 1

BUFFER MADE EASY

Remove molarity From the problem Technique

$K_a = 1.8 \times 10^{-4}$

$$[H^+] = K_a \frac{[\text{ACID}]}{[\text{BASE}]} \longrightarrow H^+ = 1.8 \times 10^{-4} \frac{[0.50\text{m}]}{[0.70\text{m}]}$$

$H^+ = 1.29e-4$

$pH = -\log(1.29e-4) = \boxed{3.89}$

0.500L of 0.50M Formic Acid and 0.70M Sodium Formate

Step 1 Convert to moles

L	M	Moles	
(0.500)	(0.50m)	= 0.25 moles	FAcid
(0.500)	(0.70m)	= 0.35 moles	Na Form (conjugate Base
(0.010L)	(1.0m)	= 0.010 moles	ADD HCL

Step 2: Determine pH Buffer

Step 3: Determine pH After Adding Base

$$H^+ = 1.8 \times 10^{-4} \frac{(0.25\text{moles Acid} + 0.010\text{mole ADD Acid})}{(0.35\text{moles Conjugt Base} - 0.01\text{moles less conc of Acid Added})}$$

$\frac{0.26}{0.34}$

Compensates for molarity

$H^+ = 1.37e-4$

$pH = -\log(1.37e-4) = \boxed{3.86}$