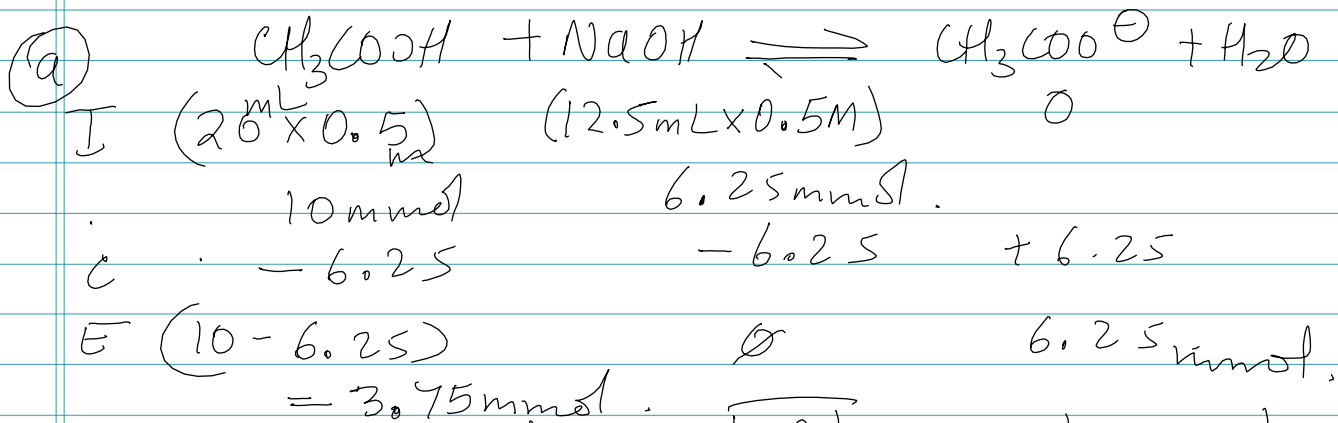


Acid-Base Eq (13) Titration (2) WA/SB.

Calculate the pH of 20.00 mL of 0.500 M  $\text{CH}_3\text{COOH}$  after adding 0.500 M  $\text{NaOH}$ .

(a) 12.50 mL acid (b) 20.10 mL  $K_a = 1.8 \times 10^{-5}$



$$[\text{H}_3\text{O}^+] = K_a \times \frac{\text{acid}}{\text{base}}$$

$$= 1.8 \times 10^{-5} \times \frac{3.75}{6.25}$$

$$= 1.08 \times 10^{-5}$$

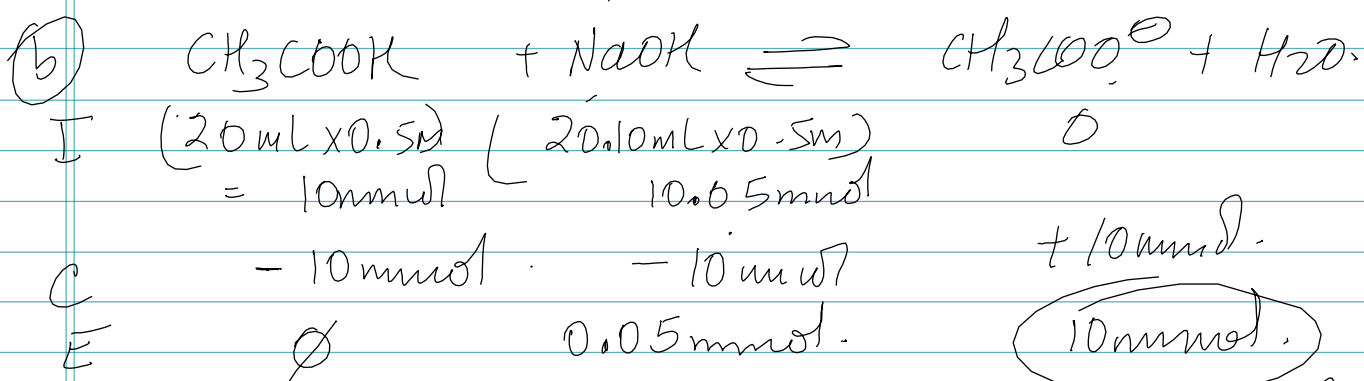
take  $-\log$   $\text{pH} = 4.97$

OR

$$\text{pH} = \text{p}K_a + \log \frac{\text{base}}{\text{acid}}$$

$$= 4.74 + \log \frac{6.25}{3.75}$$

$$= \boxed{4.95}$$



$$[\text{OH}^-] = \frac{0.05 \text{ mmol}}{(20 + 20.10) \text{ mL}} = 1.25 \times 10^{-3}$$

*ignore*

$$\text{pOH} = -\log 1.25 \times 10^{-3} = 2.9$$

$$\text{pH} = 14 - 2.9 = \boxed{11.10}$$