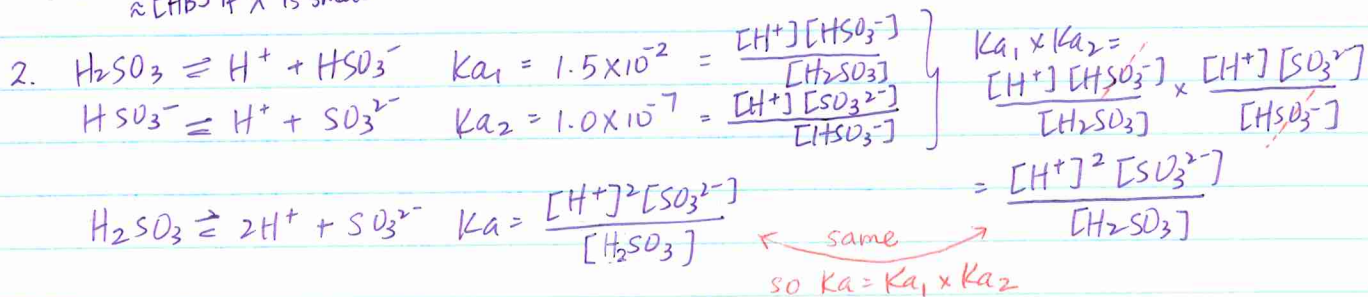
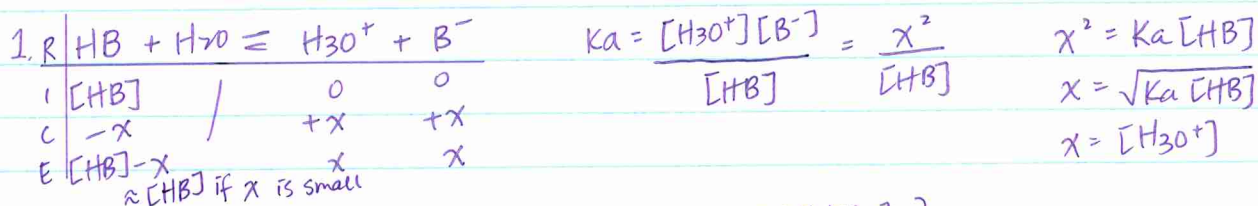
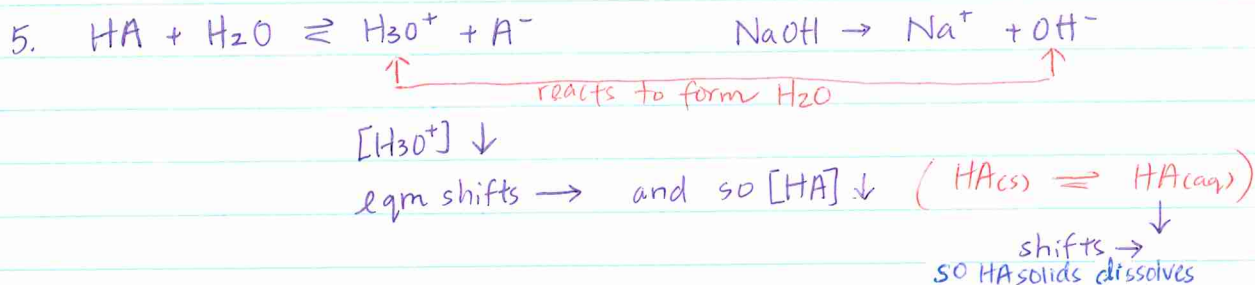
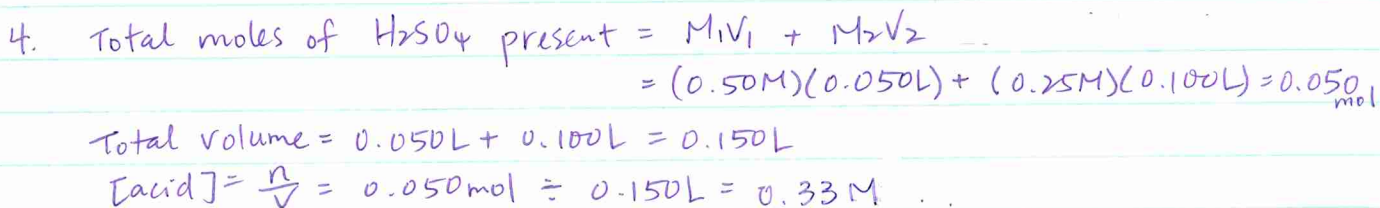
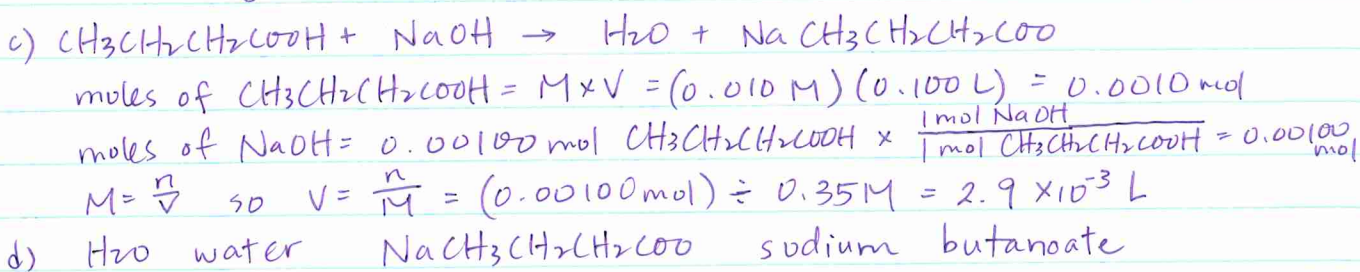
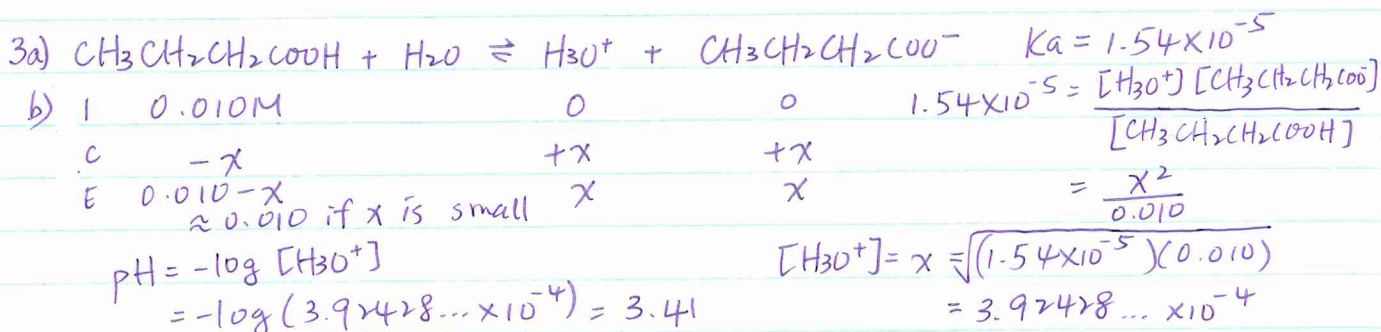
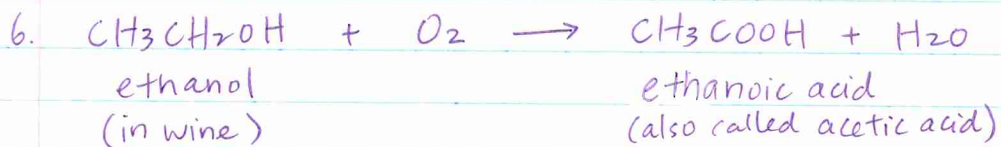


Chem 12 Acid Base Worksheet #7



$$K_a = (1.5 \times 10^{-2})(1.0 \times 10^{-7}) = 1.5 \times 10^{-9}$$





$$\text{pH} = 2.80 \rightarrow [\text{H}_3\text{O}^+] = 10^{-\text{pH}} = 10^{-2.80} = 1.584893... \times 10^{-3} \text{ M}$$

(2 s.f.)
= x



	?	0	0
C	-x	+x	+x
E	[CH ₃ COOH] _{initial} - x	x	x

$$K_a = \frac{[\text{CH}_3\text{COO}^-][\text{H}_3\text{O}^+]}{[\text{CH}_3\text{COOH}]}$$

$$1.8 \times 10^{-5} = \frac{x^2}{[\text{CH}_3\text{COOH}]_{\text{initial}} - x}$$

$$1.8 \times 10^{-5} = \frac{(1.584893... \times 10^{-3})^2}{[\text{CH}_3\text{COOH}]_i - (1.584893... \times 10^{-3})}$$

$$1.8 \times 10^{-5} \left([\text{CH}_3\text{COOH}]_i - 1.584893... \times 10^{-3} \right) = (1.584893... \times 10^{-3})^2$$

$$(1.8 \times 10^{-5}) [\text{CH}_3\text{COOH}]_i - (1.8 \times 10^{-5})(1.584893... \times 10^{-3}) = (1.584893... \times 10^{-3})^2$$

$$[\text{CH}_3\text{COOH}]_i = \frac{(1.584893... \times 10^{-3})^2 + (1.8 \times 10^{-5})(1.584893... \times 10^{-3})}{(1.8 \times 10^{-5})}$$

$$= 0.141134139 \text{ M}$$

$$\text{moles of CH}_3\text{COOH} = M \times V = (0.141... \text{ M})(1 \text{ L}) = 0.141... \text{ mol}$$

$$\text{moles of ethanol CH}_3\text{CH}_2\text{OH} = 0.141... \text{ mol CH}_3\text{COOH} \times \frac{1 \text{ mol CH}_3\text{CH}_2\text{OH}}{1 \text{ mol CH}_3\text{COOH}}$$

$$= 0.141... \text{ mol}$$

$$\text{molar mass of ethanol} = 2(12.0) + 6(1.0) + 16.0 \text{ g/mol}$$

$$= 46.0 \text{ g/mol}$$

$$\text{mass of ethanol} = 0.141... \text{ mol} \times \frac{46.0 \text{ g}}{1 \text{ mol}} = 6.5 \text{ g}$$