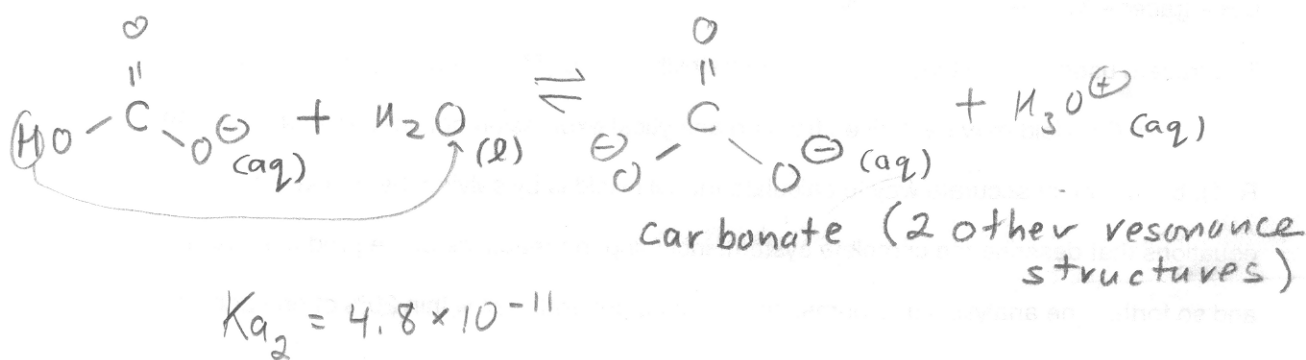
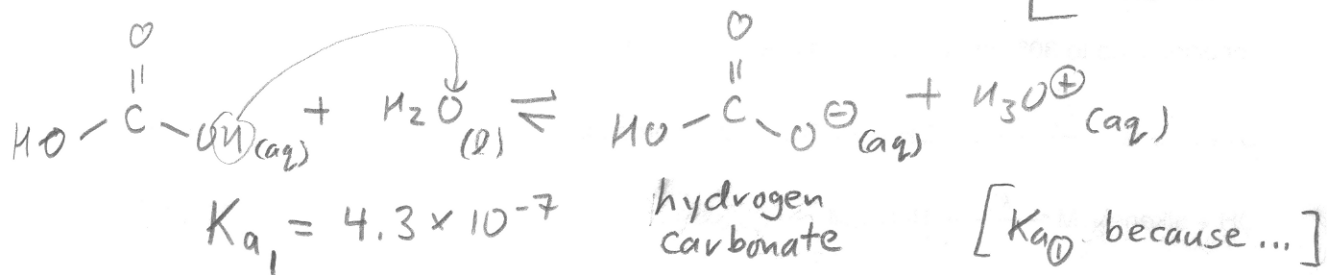
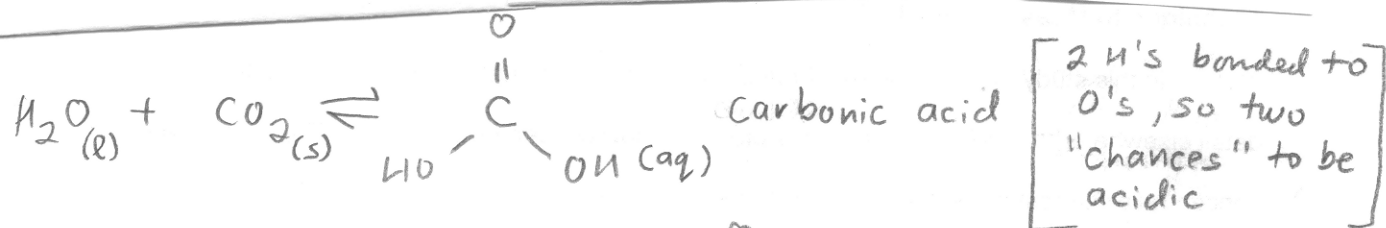


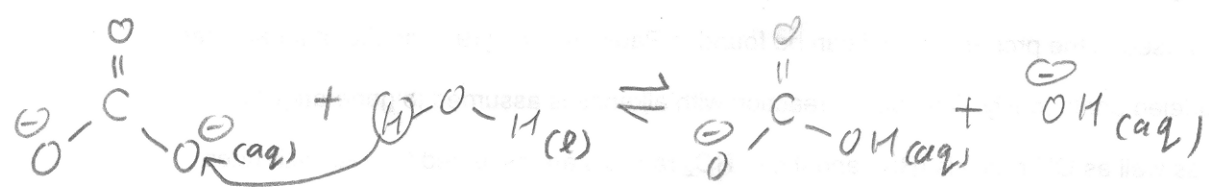
IV Polyprotic Species

Acid-Base -21
2004



Why $K_{a1} \gg K_{a2}$? Harder to pull H^{\oplus} from a negatively-charged species.

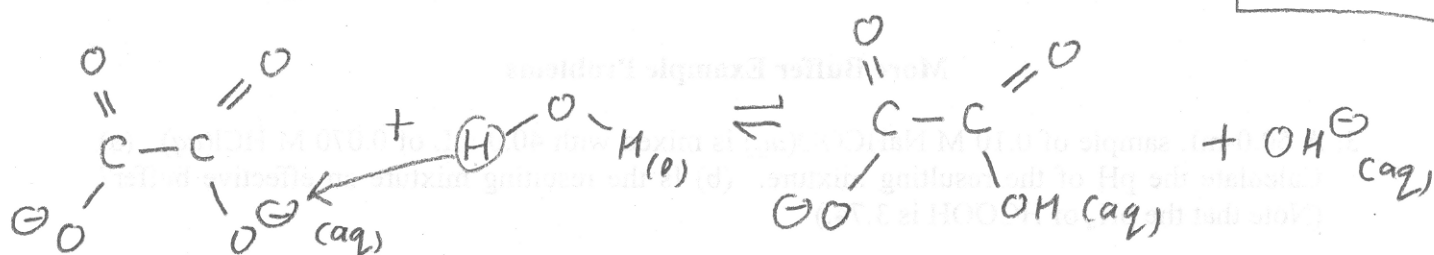
Chemistry of the weak conjugate bases:



$$K_b(CO_3^{2-}) = \frac{K_w}{K_a(HCO_3^-)} = \frac{1.0 \times 10^{-14}}{4.8 \times 10^{-11}} = 2.1 \times 10^{-4}$$

Contrast oxalate:

Acid-Base-22
2004



(3 other resonance structures)

$$K_b(\text{C}_2\text{O}_4^{2-}) = \frac{K_w}{K_a(\text{HC}_2\text{O}_4^-)} = \frac{1.0 \times 10^{-14}}{5.4 \times 10^{-5}} = \underline{1.9 \times 10^{-10}}$$

Why is $K_b(\text{CO}_3^{2-}) \gg K_b(\text{C}_2\text{O}_4^{2-})$?

↑
negative charge more delocalized
not as attractive to H^+

excess $\text{Fe}_2(\text{CO}_3)_3(\text{s})$