



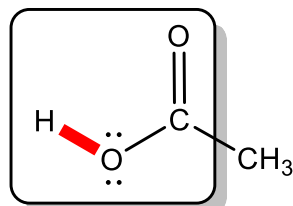
## Acids and pKa



### Acids release $H^+$ when dissolved in water

What we perceive as the taste of “sour” is actually our tongues detecting the presence of  $H^+$  cations

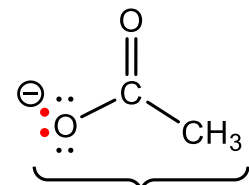
A Proton - a special CATion



Acetic Acid



and

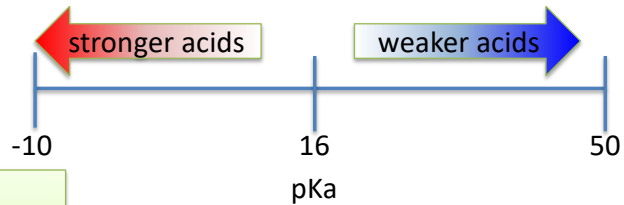


the anion

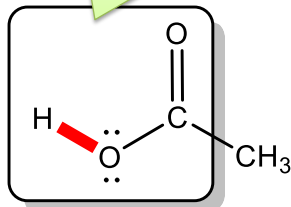
The term *acid* comes from the Latin *acidus*, meaning “sour or tart.” And it is that same Latin word that is the origin for the word *acetus* – more commonly known as vinegar.



# Acids release H<sup>+</sup> when dissolved in water



A special group of atoms called a carboxylic acid

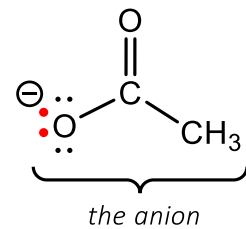


*in water*

A Proton - a special CATion



and



- The measure of how well this reaction occurs is called a **pKa**.
- Strong acids (with low pKa's) generate H<sup>+</sup> ions (and the corresponding anion) easily.



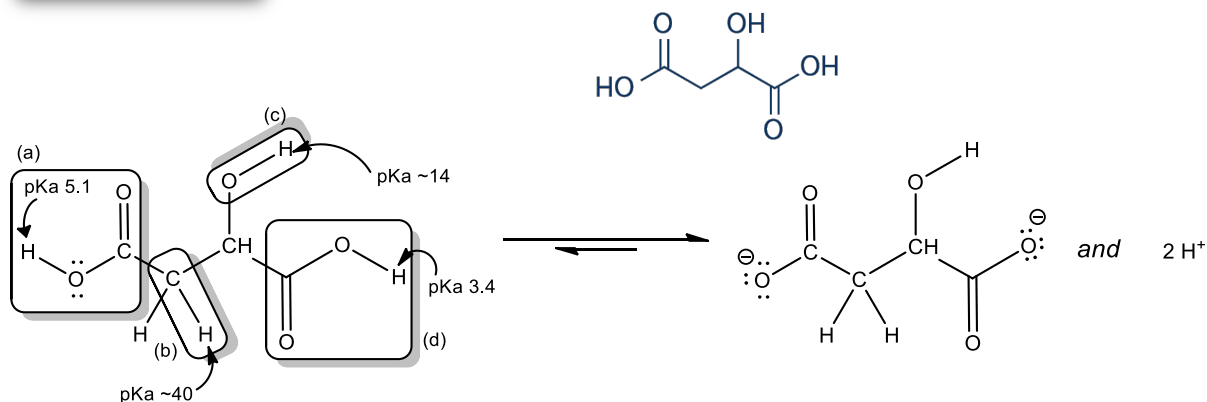
# Typical acids found in foods.

Why does citric acid have three pKa measurements listed, while malic acid has two and lactic and acetic acids each have one?

| Acid        | Structure | pKa of acid      | Food source |
|-------------|-----------|------------------|-------------|
| Acetic Acid |           | 4.75             | Vinegar     |
| Citric Acid |           | 3.15, 4.77, 5.19 | Lemon juice |
| Malic Acid  |           | 3.40, 5.11       | Apple juice |
| Lactic Acid |           | 3.88             | Yogurt      |



## The dissociation of malic acid into ions



Hydrogens (a) and (d) are lost as *protons*.

*De-protonation* (i.e. loss of a proton) does not occur for hydrogens (b) and (c).



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