The pH Scale

1. Water's Role

- all acids and bases are dissolved in water, they are all solutions. (solution = homogenous mixture) aqueous
- water breaks apart into ions (not very much)

$H_2O_{(\ell)} \rightarrow \underset{\text{acid}}{H^+_{(aq)}} + \underset{\text{base}}{OH^-_{(aq)}}$

Oct 16-8:56 AM

- No matter how concentrated the base there will always have some H^+ ions present
- No matter how concentrated the acid there will always have some OH^- ions present

Oct 16-9:30 AM

The pH Scale

- It measures the H^+ concentration in the solution

Pure water

$H_2O_{(\ell)} \rightarrow H^+_{(aq)} + OH^-_{(aq)}$

Concentration of H^+ is ...

1×10^{-7} units/litre pH = 7

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- If the solution was acidic the H^+ ions was increased

ex. 1×10^{-5} is bigger than 1×10^{-7}

0.00001 → 0.0000001 (×100)

pH 5 pH 7

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- If the solution is a base the concentration of H^+ decreases

ex. 1×10^{-10} is smaller than 1×10^{-7}

0.0000000001 → 0.0000001 (×1000)

pH 10 pH 7

Oct 16-9:47 AM

- Every step in the pH scale is a 10x increase/decrease in acidity of a solution

ex. normal rain pH = 6

acid rain pH = 5

acid rain is 10x more acidic than normal rain

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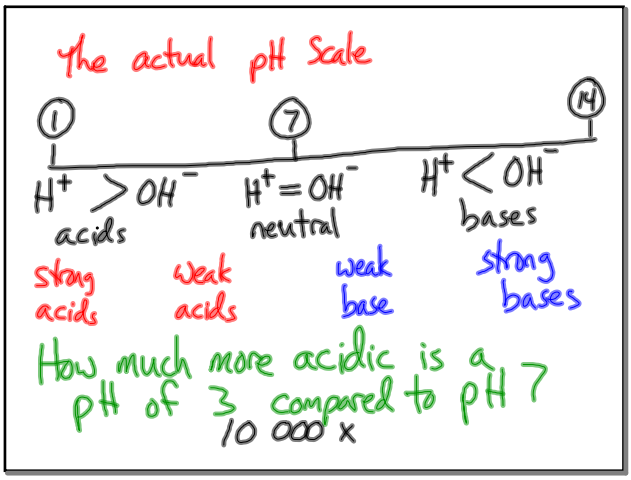

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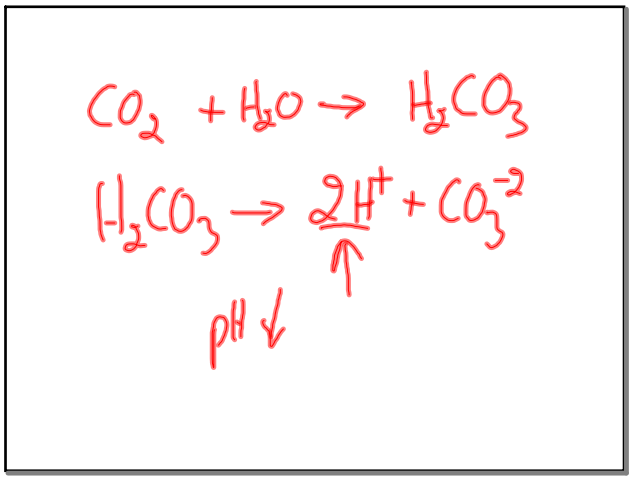

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