pH and pOH system

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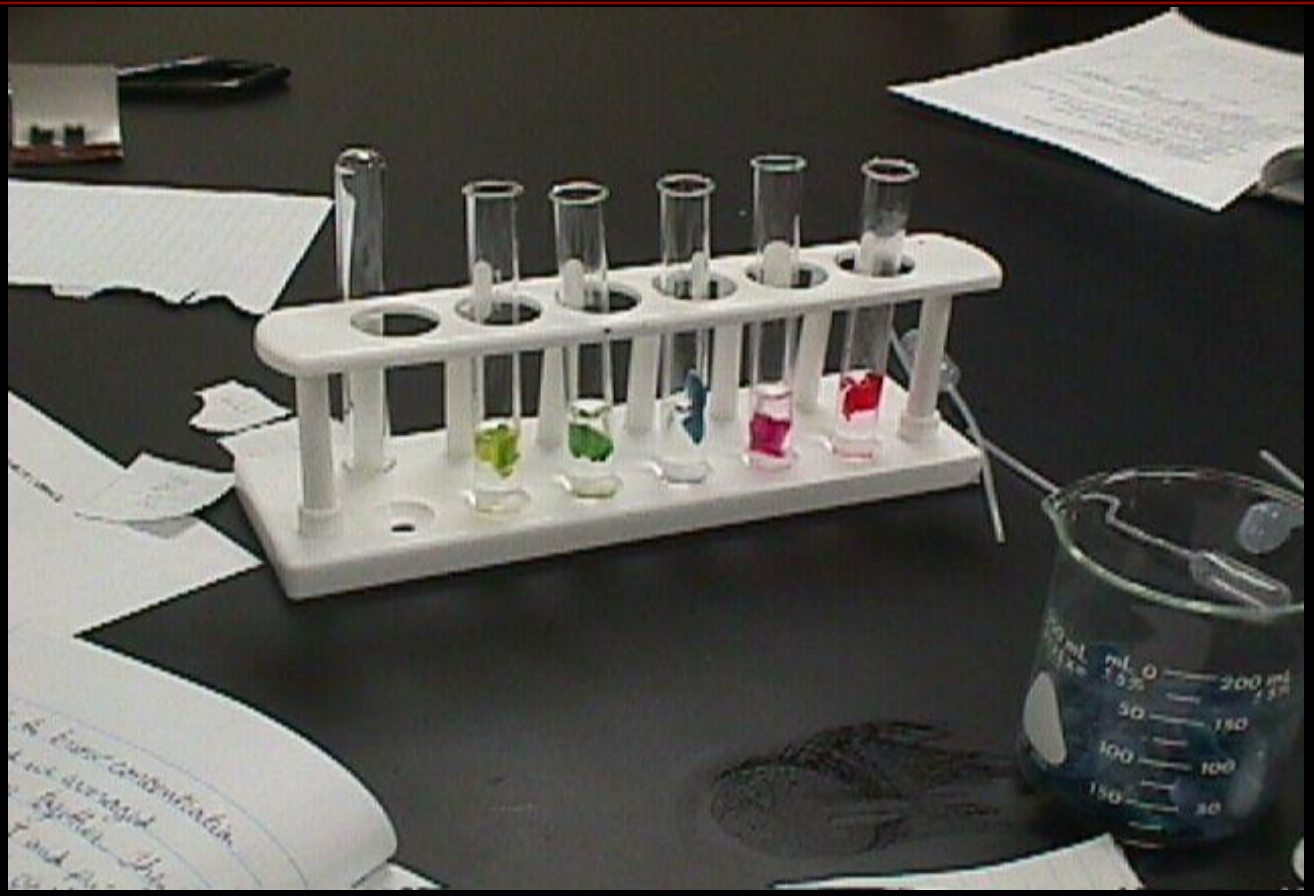
Natural pH Scales

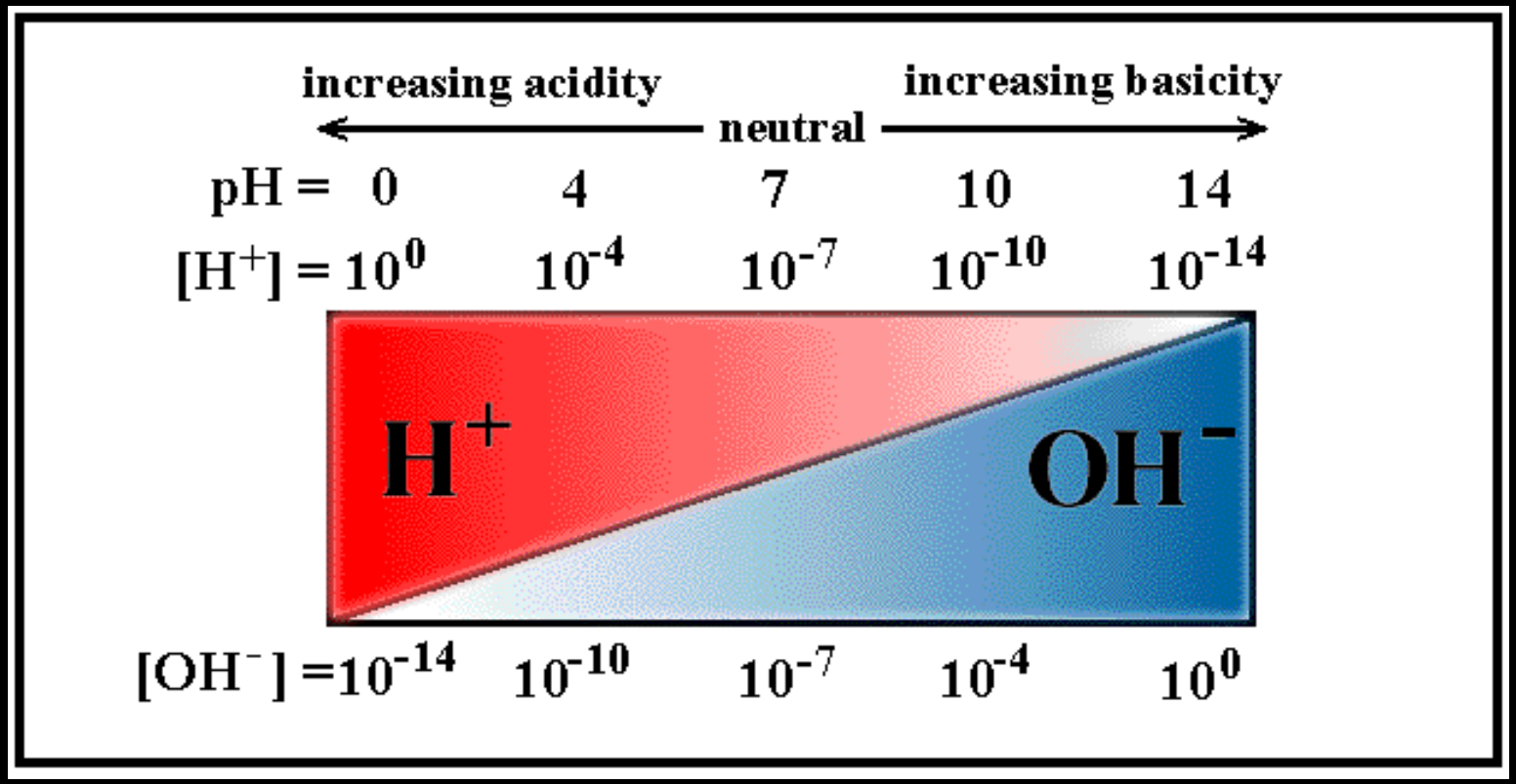


Why do we need the pH system?

- EXAMPLE:
- LETS SAY YOU WANTED TO CHECK THE ACIDITY OF YOUR SWIMMING POOL?
- YOU CONCLUDE THAT YOU HAVE A HYDRODIUM ION CONCENTRATION OF 0.0000001MOL/L…….OR…….pH of 7
- Which is easier?

pH vs pOH

Notice: H^+ and OH^- ions present are present in all solutions. Including both acidic and basic



pH & pOH Scales

pH

0 ⟷ 7 ⟷ 14

Acid Basic

pOH

14 ⟷ 7 ⟷ 0

$[H^+]$ and $[OH^-]$

- Acids
- pH < 7
- pOH > 7
- $[H_3O^+] > [OH^-]$

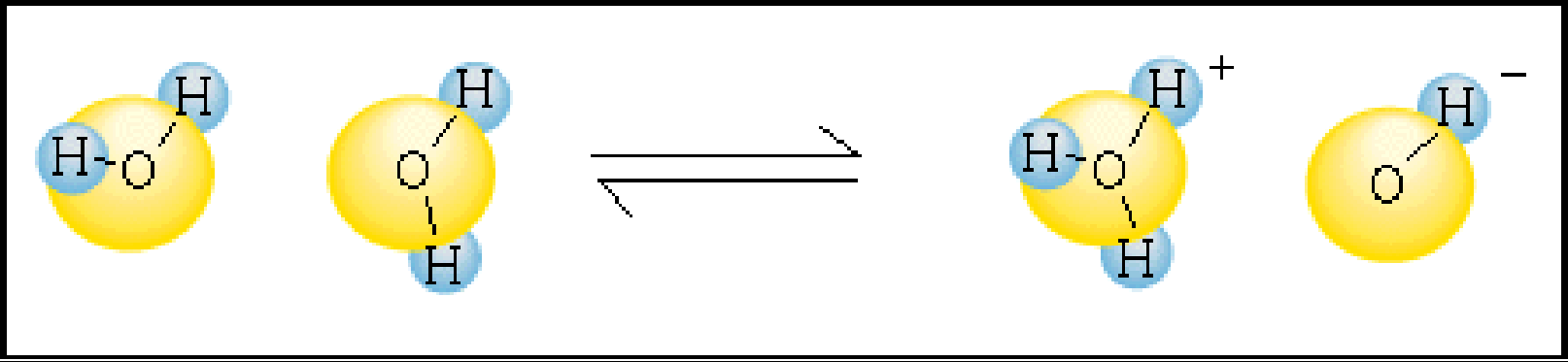
Neutral

pH = 7

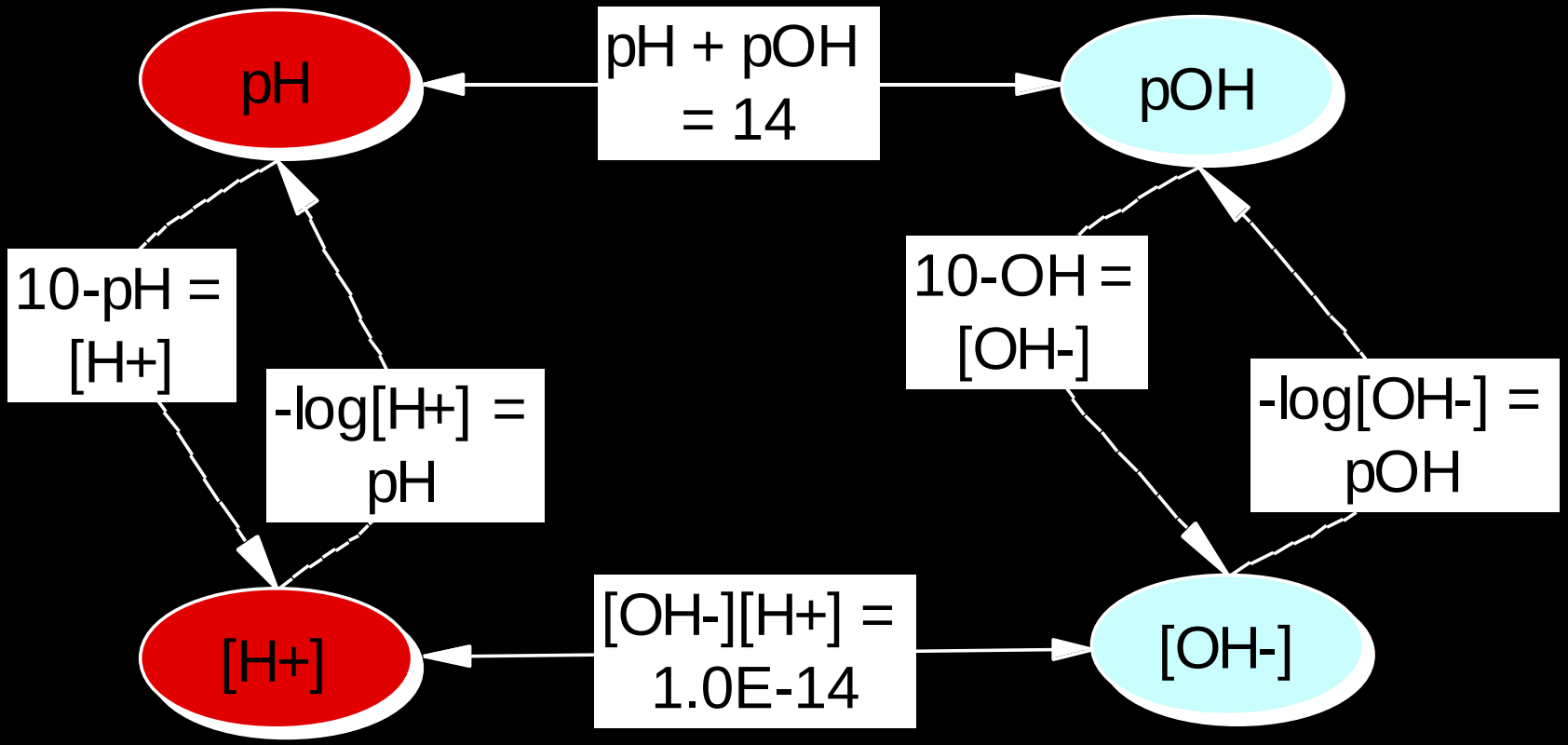
pOH = 7

$[H_3O^+] = [OH^-]$

- Bases
- pH >7
- pOH < 7
- $[OH^-] > [H_3O^+]$



ACID BASE CALCULATIONS



Mathematical pH Values

- It is possible to have a pH/pOH greater then 14 or less then 0.
- At least mathematically.
- pH = 15 pOH = -1

CALCULATE THE pH

- pOH = 7 pH =
- pOH = 10 pH =
- $[OH^-]$ = 1.0E-7M pH =
- [H+] = 1.0E-4M pH =

ANSWERS

- pOH = 7 pH = 7
- pOH = 10 pH =
- $[OH^-] = 1.0E-7M$ pH =
- [H+] = 1.0E-4M pH =

ANSWERS

- pOH = 7 pH = 7
- pOH = 10 pH = 4
- $[OH^-]$ = 1.0E-7M pH =
- [H+] = 1.0E-4M pH =

ANSWERS

- pOH = 7 pH = 7
- pOH = 10 pH = 4
- $[OH^-]$ = 1.0E-7M pH = 7
- [H+] = 1.0E-4M pH =

ANSWERS

- pOH = 7 pH = 7
- pOH = 10 pH = 4
- $[OH^-]$ = 1.0E-7M pH = 7
- [H+] = 1.0E-4M pH = 4

CALCULATE $[OH^-]$

- pH = 7 $[OH^-]$ =
- pOH = 7 $[OH^-]$ =
- $[H^+]$ = 1.0E-4M $[OH^-]$ =
- $[H^+]$ = 1.0E-10M $[OH^-]$ =

ANSWERS

- pH = 7 $[OH^-] = 1.0E-7M$
- pOH = 7 $[OH^-] =$
- $[H^+] = 1.0E-4M$ $[OH^-] =$
- $[H^+] = 1.0E-10M$ $[OH^-] =$

ANSWERS

- pH = 7 $[OH^-] = 1.0E-7M$
- pOH = 7 $[OH^-] = 1.0E-7M$
- $[H^+] = 1.0E-4M$ $[OH^-] =$
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ANSWERS

- pH = 7 $[OH^-] = 1.0E-7M$
- pOH = 7 $[OH^-] = 1.0E-7M$
- $[H^+] = 1.0E-4M$ $[OH^-] = 1.0E-10M$
- $[H^+] = 1.0E-10M$ $[OH^-] =$

ANSWERS

- pH = 7 $[OH^-] = 1.0E-7M$
- pOH = 7 $[OH^-] = 1.0E-7M$
- $[H^+] = 1.0E-4M$ $[OH^-] = 1.0E-10M$
- $[H^+] = 1.0E-10M$ $[OH^-] = 1.0E-4M$

Note to remember!

- pH = 7 pOH = 7
- $H^+ = OH^- = 1.0E\text{-}7M$

Keep in mind, 1.0E-7M is the middle of the road!