

Review 04

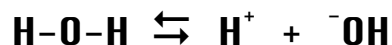
Neutrons and isotopes

Isotopes have differing numbers of neutrons for the same element
“normal” “heavy/light” radioactive

Water

- ☆ Due to its cohesiveness, has “magical” properties
 - one water molecule hydrogen bonds to as many as four other water molecules at a time
 - results in very unique characteristics for water, such as
 - ⇒ surface tension
 - ⇒ high heat capacity
 - ⇒ unexpectedly high melting and boiling points
 - ⇒ ice floating rather than sinking
 - ⇒ adhesion to other polar substances
- ☆ Acts as SOLVENT into which *polar substances* dissolve
 - solute must be polar; able to attract water molecules due to complete or partial charges = hydrophilic
 - non-polar solute *will not* dissolve into water; doesn't attract water molecules due to non-polar nature = hydrophobic

☆ Dissociates



- # water molecules in pure water dissociated reflects the mid-point of the pH scale
- pH is measure of concentration of H^+ in a solution; = $-\log_{10}[\text{H}^+]$
 - < 7 is acidic; lower the number, greater the H^+ conc.
 - > 7 is alkaline; greater the number, lower the H^+ conc.
 - = 7 is neutral (= amount of dissociation of pure water)
- ACID = substance which releases H^+ into a solution; lowers pH
e.g. Acetic Acid; Hydrochloric Acid
- BASE = substance which removes H^+ from a solution; raises pH
e.g. Sodium Hydroxide
- BUFFERS = substances that resist changes in pH
 - ✓ living systems heavily buffered to maintain proper pH