

Reading Guide chapters 3 – 4

1. Why is water polar?
2. How many other water molecules can hydrogen bond to water?
3. Define the following properties of water; include a molecular explanation for each property.
 - Cohesion

 - Adhesion

 - Specific heat

 - Evaporative cooling

 - Heat of vaporization
4. Connect the following observations to the property of water that is responsible for them:
 - a. Coastal areas have milder climates than adjacent inland area
 - b. Ocean temperatures fluctuate much less than air temperatures on land
 - c. Insects like water striders can walk on the surface of a pond without breaking the surface
 - d. If you slightly overfill a water glass, the water will form a convex surface above the top of the glass
 - e. If you place a paper towel so that it touches spilled water, the towel will draw in the water.
 - f. Ice floats on water.
 - g. Humans sweat and dogs pant to cool themselves on hot days.
5. What is the relationship between H^+ ions and OH^- ions in the following solutions:
 - a. acidic
 - b. basic
 - c. neutral
6. What is a buffer?
7. What is the difference in H^+ concentration between a solution with pH of 4 and a pH of 7?
8. What is a hydrocarbon?
9. Is a hydrocarbon hydrophilic or hydrophobic? Explain.
10. What is an isomer?

11. Complete the table below:

| Functional Group | Structure | Name of Compound | Functional properties |
|------------------|--------------------|-----------------------|--|
| sulphydryl | | | |
| | N – H ₂ | | |
| | | Aldehydes and ketones | |
| | - OH | | |
| | | | Involved in energy transfer between organic molecules. |
| carboxyl | | | |