Test 1 Review

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September 22, 2024

Part I

Life

1 7 characteristics

- Actively maintain organized complexity
- Grow
- Reproduce
- Use energy and materials
- Evolve
- Sense and respond to stimuli

2 Evolution

Definition 1 (Evolution)**.** *Change in gene frequencies in a population over time.*

Part II

Chemistry

Definition 2 (Covalent bond)**.** *In a covalent bond, the orbital rearranges so that electrons spend more time between nuclei, causing an attraction. The nuclei get closer to each other*

until the attraction is counter-acted by their repulsion.

Definition 3. *An attraction between two molecules of partially opposite charges.*

3 Water

3.1 Surface Tension

Arises from the cohesive properties of water. The attraction between polar water molecules causes them to stick together and to the water beneath, rather than to the air, enabling it to support some weight before it breaks.

3.2 Specific heat

Water has high specific heat because the added energy first goes to breaking the hydrogen bonds, which takes a ton of energy, before they increase the kinetic energy of the molecules (which heats the water up).

Definition 4 (Specific heat)**.** *The amount of heat required to raise a gram of substance by one celcius.*

3.3 Weak bonds

Supports capillary action and makes water a powerful solvent.

4 Carbon

1. forms 4 stable covalent bonds
2. can bond to many side groups - more variety
3. can form long chains held by stable cc bonds
4. carbon can form single, double, triple bonds - lots of variety.

Part III

Biomolecules

5 Protein

Examples: collagen, keratin, hemoglobin

6 Lipids

A phospholipid is ocnsisted of glycerol, two fatty acid tails, and a phosphate group + variable functional group. This group is hydrophilic due to the presence of nitrogen.

Steroids are composed of four carbon rings. Can form hormones, cholestrol, testerone, etc.