As water is used to convert ATP to ADP, this is a hydrolysis reaction - catalysed by the enzyme ATP hydrolase.

Synthesis of ATP:

- Reversible reaction - to be reversed a condensation reaction is needed - catalysed by the enzyme ATP synthase.
- This reaction occurs in three ways - in chlorophyll containing plant seeks during photosynthesis; in plant/animals cells during respiration.

Roles of ATP:

Not a good long term energy store - fats, carbohydrates and glycogen serve this purpose a lot better. ATP is for immediate energy source of a cell. ATP is rapidly reformed from ADP and an inorganic phosphate.

Better immediate source of energy than glucose;

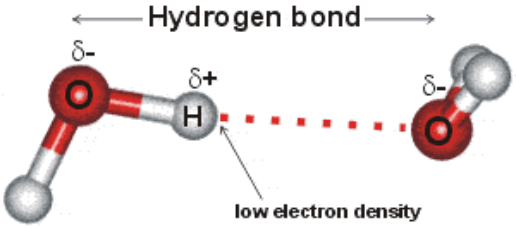
- each ATP molecule releases less energy than each glucose molecule. The energy for reactions is therefore released in smaller, more manageable quantities.
- The hydrolysis of ATP to ADP in a single reaction releases energy. The breakdown of glucose is a longer series of immediate energy and there fore the energy release takes longer.

ATP cannot be stored so has to be continuously made within mitochondria cell. Areas that require a large amount of energy, have a large quantities of mitochondria. Energy requiring processes include;

- metabolic processes - provides energy for the build up f macromolecules from their basic units
- Movement
- Secretion

3.1.7 Water

A water molecule is made up of two hydrogen atoms and an oxygen - negative (o2) poles and positive (H) poles makes it a dipolar.



Hydrogen bonding: different poles attract, and therefore the positive pole of one water molecule and the negative pole of another will be attracted to each other. The attractive forces between poles is a hydrogen bond.

Specific heat capacity: the energy needed to change he temp of a substance to rise by 1 degree.

Latent heat of vaporisation: Hydrogen bonding means that it requires lots of energy to evaporate 1 gram of water.

Cohesion and surface tension in water: the tendency of molecules to stick together is cohesion. With its hydrogen bonding, water has large cohesive forces and these allow it to be pulled up the xylem vessel. Where water meets the air they tend to be pulled back into the body rather than escaping it - surface tension.

Water in metabolism: water is used to break down molecules by hydrolysis and is needed in photosynthesis.