

B.Sc.

ZOOLOGY (HONOURS) -

PART - III

PAPER - VI

FROM

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ATP-  
Adenosine Triphosphate

①

B.Sc-III<sup>rd</sup>

PAPER-VI

- o A molecule that carry energy within cells.
- o It's a end product of the process of phosphorylation (adding a phosphate group to a molecule using energy from light, cellular respiration and fermentation)
- o Also used in - signal transduction pathway for cell communication and is incorporated into - DNA, during - DNA, synthesis

o ATP - made of molecule - Adenosine

Adenosine - made of - adenine and ribose sugar

- Soluble in water

- High energy content due to

having two phosphoanhydride bonds connecting the 3 phosphate group

- When it's hydrolyzed and converted to ADP - energy is released

- The removal of one phosphate group

releases - 7.3 Kcal per mol or

30.6 kJoule per mole under  
standard condition

- ADP: converted <sup>back</sup> to ATP, so that the energy  
is available for other cellular rxn.

- Phosphorylation - specific method for  
plants & cyanobacteria

- Creation of ATP from - ADP  
using energy from sunlight, & occurs  
during photosynthesis

ATP - Also formed from cellular respiration  
in mitochondria of cell (Aerobic resp.)

Aerobic resp. - require  $O_2$

- Produce - CO<sub>2</sub> + H<sub>2</sub>O, from  
glucose & oxygen.

Anaerobic resp. use chemicals other than  $O_2$

- This is used by archaea  
and bacteria, that live in - anaerobic  
environments

Fermentation - - Another way of producing - ATP

- It does not - use an electron transport  
chain

- ex: - yeast & bacteria

(3)

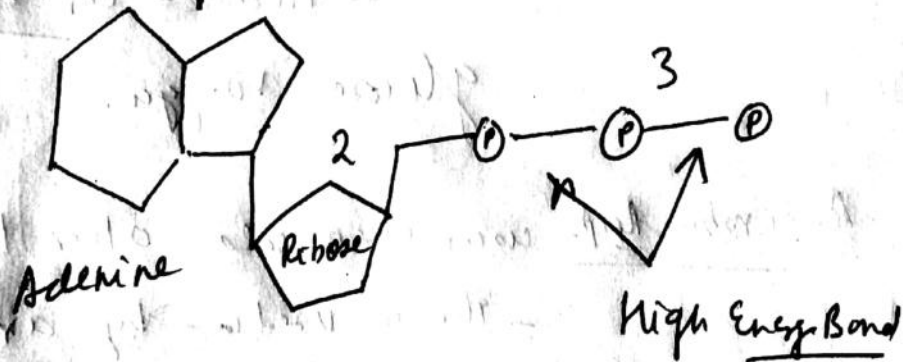
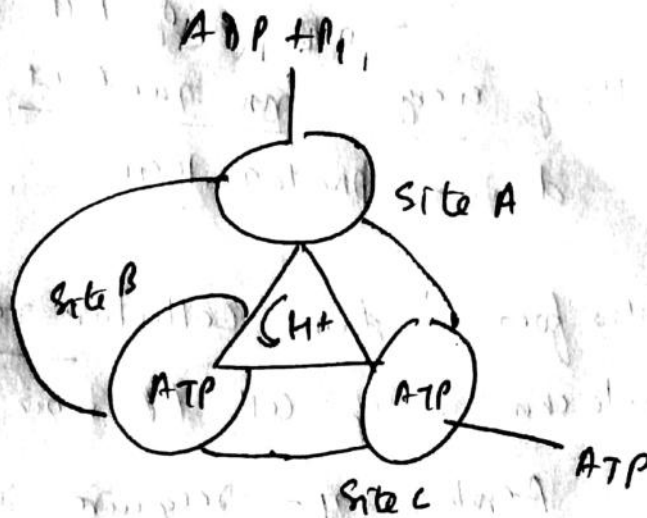
# ATP - formation

Chemical Formula



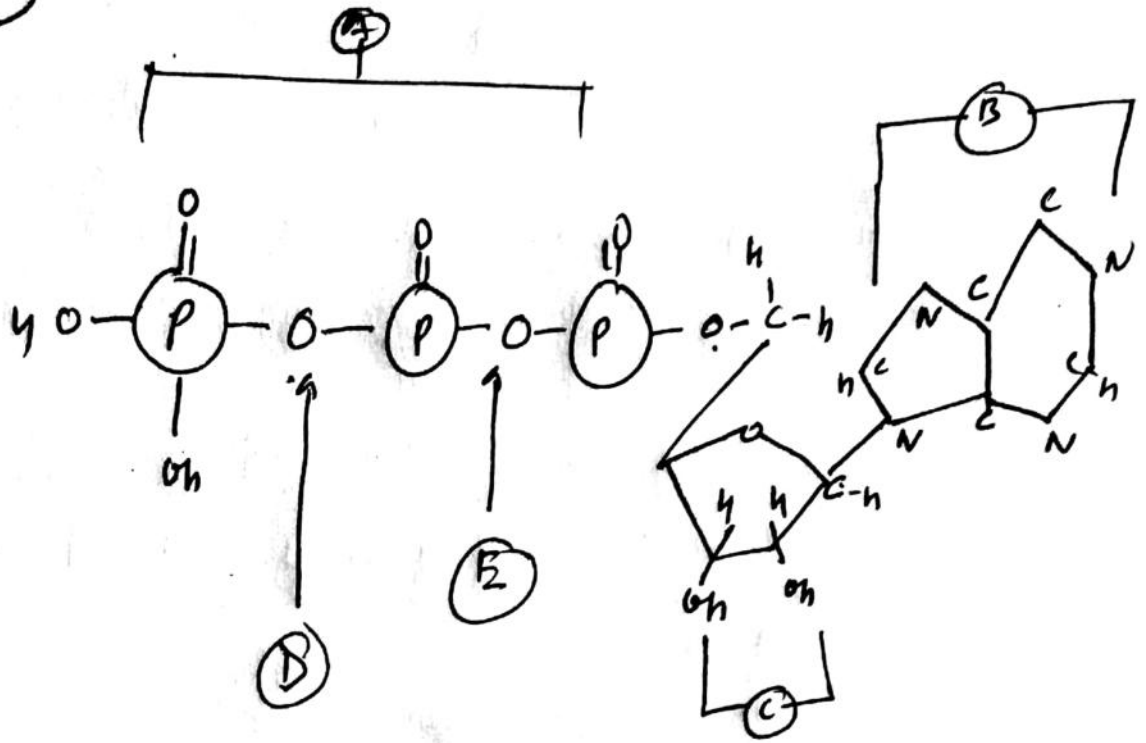
Acidity - (pKa) : 6.5

Molar Mass - 507.18 g/mol



Structure of ATP

(4)



Role  
ATP - Muscle Contraction, Nerve Impulse Propagation  
Chemical synthesis

- Energy currency

— 6 —

Next Day - class:-

- ① Signal transduction
- ② DNA synthesis
- ③ PomP
- ④ cAMP

*N. G.* 11-2020