

Concept 7.3

ATP provides energy for cellular work.

How ATP Packs Energy:

ATP = adenosine triphosphate

Adenosine

- adenine
- ribose

Triphosphate “tail”

- three phosphate groups

Each phosphate group is negatively charged. Thus the ATP tail has potential energy stored like compressed springs.

One or both of the phosphate bonds may break during chemical reactions and release the potential energy.

Usually only one phosphate group is lost from ATP and the resulting molecule is called **adenosine diphosphate**, or **ADP**.

ATP and Cellular Work:

During a chemical reaction that breaks one of ATP's bonds the phosphate group is transferred from ATP to another molecule. The molecule that accepts the phosphate undergoes a change, driving work.

Types of work

Chemical work - building molecules

Mechanical work - contraction of muscles

Transport work - pumping solutions across a membrane

The ATP Cycle: