

Concept 8.2

The light reactions convert light energy to chemical energy.

Light Energy and Pigments:

- Wavelength
- Electromagnetic spectrum
700nm to 400nm / ROYGBIV

Pigments and Color:

- A substance's color is due to pigments
- Things that happen to wavelengths
 - Absorbed
 - Transmitted
 - Reflected

Chlorophyll *a* - absorbs blue-violet and red light.

Chlorophyll *b* - absorbs blue and orange light and reflects yellow-green.

Carotenoids - absorb blue-green and reflects yellow-orange.

Harvesting Light Energy:

Photosystem - molecules and chlorophyll arranged in clusters in the thylakoid membrane.

Pigment molecules absorb light energy and an electron is raised to a high-energy "excited- state". When the electron drops back to the ground state it

excites the next pigment molecule until it arrives at the reaction center of the photosystem. The primary electron acceptor traps the electron from chlorophyll *a* and now other molecules built into the thylakoid membrane can now use the energy to make ATP and NADPH

Chemical Products of the Light Reactions:

Two photosystems are involved in the light reactions. The first traps energy and transports it to an electron transport chain.

The electron transport chain releases energy used to make ATP.

The second photosystem produces NADPH by transferring excited electrons and hydrogen ions to NADP .