

# What is the value of white light?

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Light is photons, a type of particle. Although, light can also be described as waves, since it has wave-like properties as well. Thus light is a complex physical phenomenon, which makes our eyes distinguish things about our surroundings.

It is a fact that if one has a wheel of all the colours of the rainbow and makes the wheel spin, our eyes will perceive white colour. This is a simple example of how to interpret the fact that white light consists of all the colours visible to humans. The different colours are characterized by light of different wavelengths, which is a measure of the length of a light wave. Blue is the colour with the shortest wavelength humans can see. Red is the colour with the highest wavelength. The white light consists of colours throughout the whole visible light spectrum, from blue to red.

There exist molecular materials that whilst in their powdered form would generate white light when irradiated with low power infrared laser light. Infrared light is light with a wavelength longer than that of red light, which lies outside of the visible light spectrum. White laser light is usually generated in labs with the help of very high power lasers and specially designed photonic fibers or crystals. This makes these high power lasers very expensive to operate. Despite this fact, producing this white light from the found molecular material is not too difficult using a much simpler setup. The setup is compact and not very large. It consists of different parts such as mirrors, lenses, a laser pointer, and a light detector. The entirety of the setup essentially operates as a microscope.

The infrared laser pointer used in the setup is of low cost. This technique of producing white light would therefore work as a terrific substitution of more expensive methods in e.g. optical instruments that are used for medical imaging. The molecular powders also have the potential of making solar cells more efficient. Some of the sunlight is infrared and cannot get made into energy by existing solar cells. These powdered materials could solve that problem. By transforming the infrared sunlight into white light, it could then get absorbed by the solar cells and transformed into energy.

Using the found powdered materials as a method of generating white laser light would mean savings in costs in the fields where it potentially could

be applied. Because of this, the potential improvements of this method are vital for research to move forward and become more stable, economically sustainable and also simplified.