

Question: What effect does light have on chlorophyll if it is removed from a living plant?

Materials

- beaker of prepared chlorophyll solution (provided by your teacher)
- strong light source (such as a slide projector)

Procedure

1. In a darkened room, shine a strong beam of light at a sample of chlorophyll solution.
2. Observe the colour of the chlorophyll by viewing the sample at a slight angle.
3. Observe the colour of the chlorophyll by viewing the sample at a right angle to the beam of light.
4. Describe the colour you see in steps 2 and 3.

Analysis

1. Recall, from previous studies, that visible light is a mixture of different colours (wavelengths). Which colours of light do you think chlorophyll absorbs? Explain your reasoning.

2. Chlorophyll has a property called fluorescence. When a pigment molecule absorbs a specific colour (wavelength) of light, its electrons become “excited”—that is, they move to a higher energy state. Almost immediately, the excited electrons return to their original, lower-energy state as they emit (give off) the energy they absorbed. The emitted energy is visible as light of a longer, lower energy wavelength. In which step did you observe fluorescence? Suggest a possible explanation for what you observed.