

Name: _____ Date: _____

Photoluminescence (Sek. II/upper secondary)
Luminous colours – fluorescence and phosphorescence

Group M: Luminescence within a [m]atrix

E3 Place 5 g tartaric acid each in two test tubes and heat them carefully with the roaring blue flame of a burner. As soon as you observe a highly viscous melt, add a) 1 mg fluorescein, and b) 5 mg aesculin. Twist and turn the test tubes so that the melt spreads the inside wall and let it freeze. Then irradiate the samples with the violet LED torch in the dark at different temperatures: i) at room temperature, ii) at approx. 0°C (use iced water), iii) at approx. 70°C (use a hot water bath).

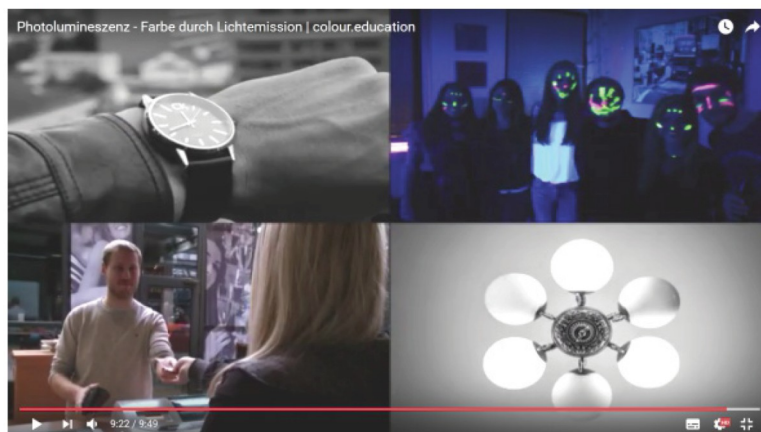
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M1 Watch the German tutorial “Photolumineszenz”. Assign the two luminescent phenomena from E3 to the technical terms ‘fluorescence’ and ‘phosphorescence’ and draw energy level diagrams in explanation of them.



M2 In comparison with the emitted photons during fluorescence, the ones emitted during phosphorescence have undergone a bathochromic shift (‘red shift’). Explain this observation by means of your findings in M1.

M3 Explain why a cold sample phosphoresces longer than a warm one.

M4 Interpret the function of the tartaric acid in E3 by referring back to your observations.