Learn Chemistry

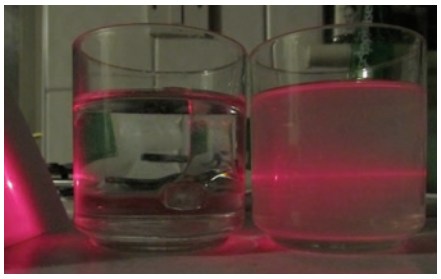
Enhancing learning and teaching with the RSC

The Tyndall Effect Instructions: Why is the sky blue and the sunset red? It's all to do with light scattering and the Tyndall Effect.

Tyndall effect

Equipment per person/pair/group

- Milk/powdered milk
- Small torch or light
- Laser pointer
- Water
- 2 Clear straight-sided glass/jar



Instructions

1. Put water in both glasses/jars and place them next to each other
2. Add a very small amount of milk to one of them so it just looks cloudy.
3. Shine the laser pointer through both of them. You should be able to see the beam go through one glass and not the other. In which one can you see it?
4. Now take the torch and place it on the surface of the glass containing the milk and water, shining inwards. Look at the light through the liquid from different angles. Some angles give you a yellowy-orange-red colour, and at other angles the liquid looks blue.

What's happening?

The milk particles suspended in the water cause any light going through it to scatter. This means that we can see the light coming from the laser pointer beam as some of the light is scattered in different directions. This scattering does not occur in the water so the beam can not be seen in this glass.

When the torch is put up to the milk solution, light scattering occurs again. Because the torch is producing light of different wavelengths which scatter differently, this separates the blues from the reds and oranges so we can see these colours in different places, depending on the angle we look at it from. This same light scattering occurs in our atmosphere because of particles present in the air. This gives us our blue sky, and gives us a red and yellow sunset.

Disposal

- Pour the liquid down the sink