

The cover features a large, central orange circle with a crumpled paper texture. This circle is surrounded by several overlapping, semi-transparent rings in shades of yellow, red, and pink. The background is a dark blue-grey color. In the bottom right corner, there is a stylized logo for the Royal Society of Chemistry, consisting of concentric, semi-circular segments in yellow, orange, and grey. The text 'THERMOCHROMIC MATERIALS' is written in white, bold, sans-serif capital letters across the top half of the orange circle. The text 'ROYAL SOCIETY OF CHEMISTRY' is written in white, bold, sans-serif capital letters to the right of the logo.

THERMOCHROMIC MATERIALS

ROYAL SOCIETY
OF CHEMISTRY

THERMOCHROMIC MATERIALS

Thermochromic materials change colour depending on the temperature. These smart materials can be used for fun things like toys and clothing as well as more serious products like thermometers, battery testers, fraud deterrents and food temperature indicators.

Things appear coloured because they absorb and reflect certain wavelengths of light. When thermochromic materials absorb heat their chemical or physical structure changes so that they absorb and emit different wavelengths of light, and look a different colour.

Lovely Leuco Dyes

Many thermochromic products use leuco dyes. These chemicals change from a coloured to a colourless form over a particular temperature range and can be incorporated into lots of different materials including inks, plastics and fabrics. Want to know if your gig ticket is authentic? Some venues now use leuco dyes to print a hidden symbol on genuine tickets which appears briefly when rubbed with a warm finger!

Clear-cut Liquid Crystal

Liquid crystal is more expensive and difficult to work with, but can be engineered to change colour at a precise temperature - ideal for products like forehead thermometers. Liquid crystal is also used in so-called 'mood rings' which change colour according to body temperature - although there is no scientific evidence that this is a good indicator of a person's mood!

As designers find more and more uses for these smart materials we can look forward to a more colourful future. Can you think of a good use for thermochromic materials?

Teachers – want more ideas for colour-related chemistry practicals and demonstrations? Visit the Learn Chemistry website at <http://rsc.li/learn-chemistry> and search for 'colour'

