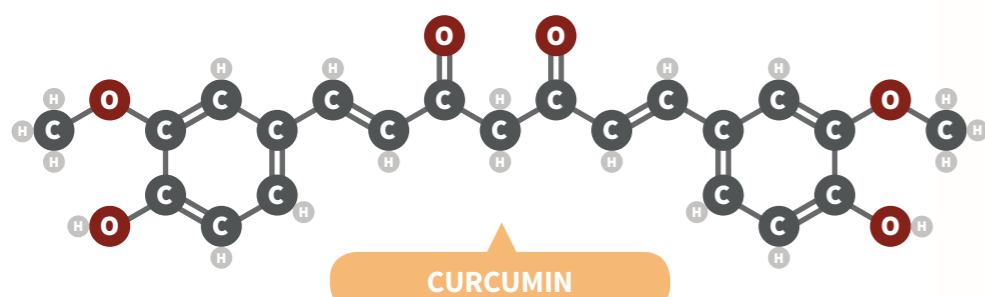


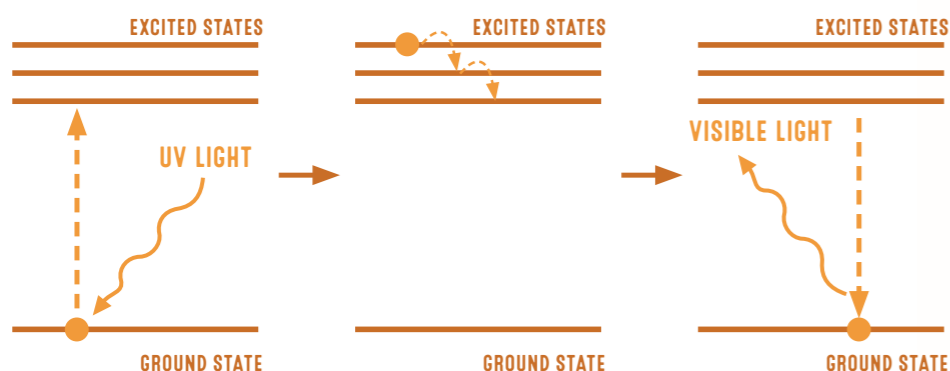
THE CHEMISTRY OF TURMERIC

Tumeric is a spice lauded for its supposed health benefits, and there are also some neat chemistry tricks you can do with it. Here we look at both!

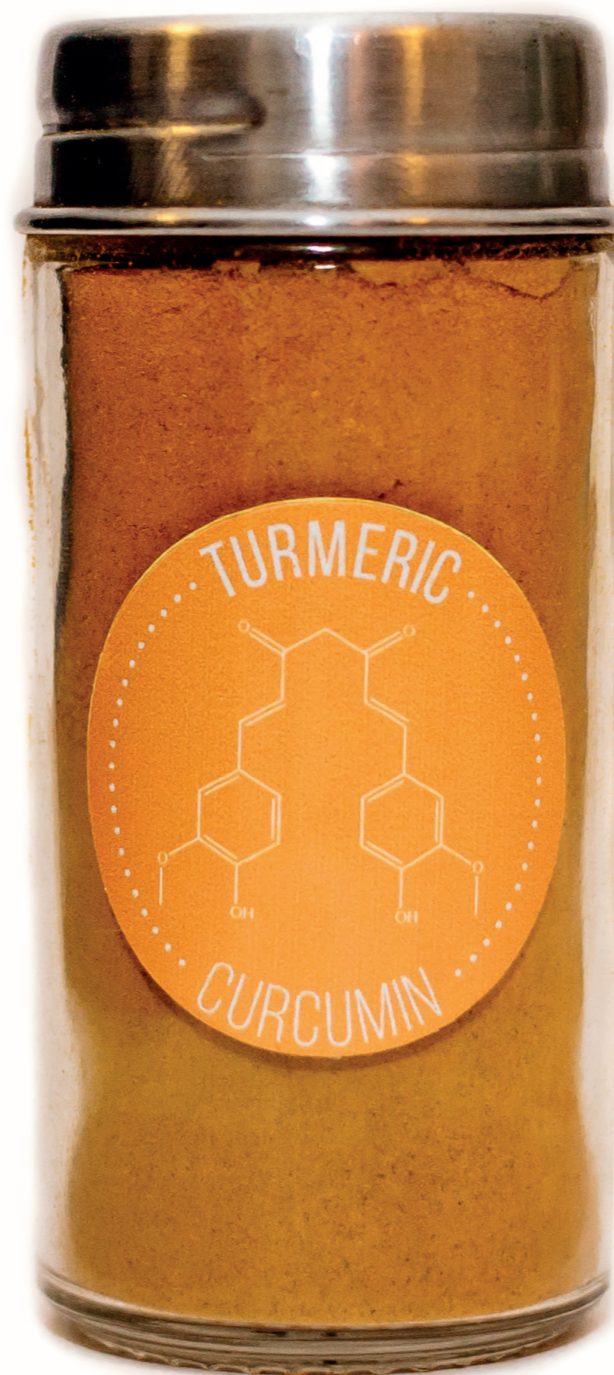
TURMERIC FLUORESCENCE



Curcumin is a key chemical component of turmeric, and can also make it fluoresce in the right conditions. If turmeric is sprinkled into alcohol whilst illuminated by UV light, a bright green-yellow fluorescence can be seen. Alcohol is used as curcumin is soluble in alcohol but not in water, and this helps make the fluorescence visible.

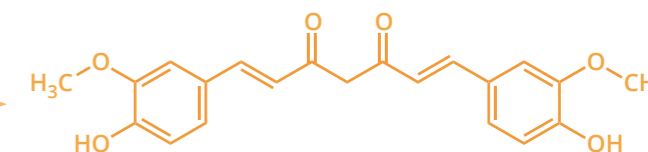


This fluorescence happens because the electrons in the curcumin molecules absorb the ultraviolet light, causing them to gain energy and move to an excited state. Some of the extra energy is lost as vibrational energy, and then the electrons fall back to the ground state, emitting visible light as they do so. This gives the green-yellow glow.

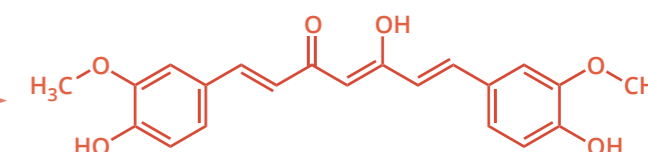


TURMERIC AS AN INDICATOR

DIKETONE FORM



KETO-ENOL FORM



Curcumin's chemical structure is subtly different in acidic and alkaline solution. This allows it to be used as an indicator. When added to acids, it remains the yellow colour of turmeric. However, when added to an alkaline solution above pH 8, the shift of a hydrogen atom causes the compound to change colour, giving a red hue.

TURMERIC HEALTH BENEFITS



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Anti-inflammatory, anti-oxidant and anti-cancer properties of curcumin have been observed in animal and laboratory studies. However, at present there have been too few clinical trials in humans to be able to confirm these effects. Curcumin is poorly absorbed and rapidly metabolised and eliminated when eaten, so little reaches our circulation.



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