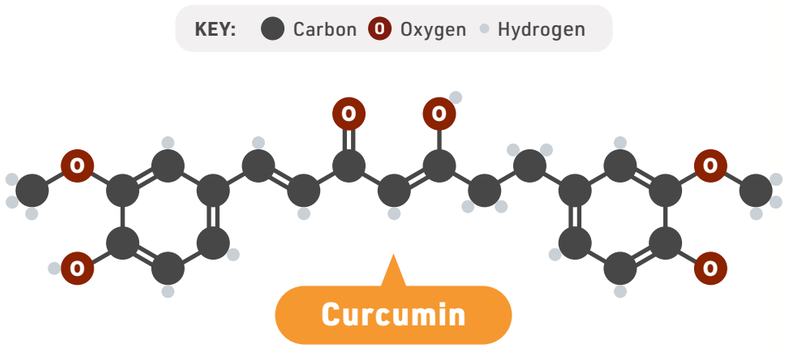
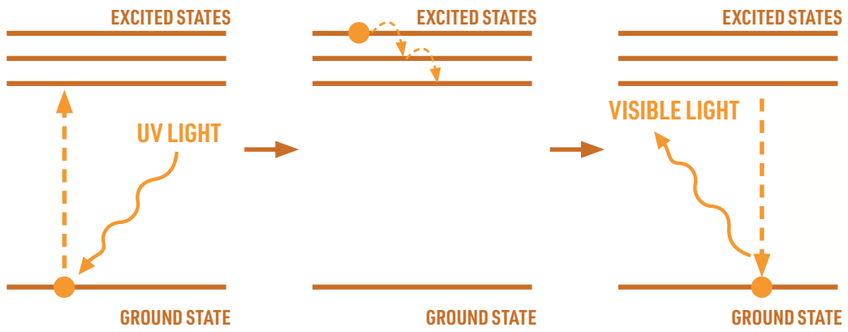
Turmeric: Fluorescence, colour, and health effects

COMPOUND INTEREST

Turmeric fluorescence

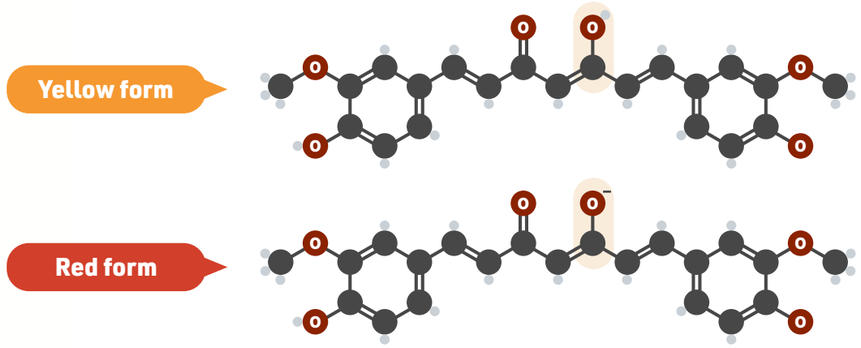


Curcumin is a key component of turmeric, and makes it fluoresce in the right conditions. If you sprinkle turmeric into alcohol while illuminating it with UV light, a bright green-yellow fluorescence is seen. Alcohol is used as curcumin is soluble in alcohol but not in water, and this helps make the fluorescence visible.



The fluorescence happens because electrons in the curcumin molecules absorb the UV light, gaining energy and moving to an excited state. Some of the extra energy is lost as vibrational energy and the electrons fall back to the ground state, emitting visible light as they do so. This gives the green-yellow glow.

Turmeric as a pH indicator



Curcumin's chemical structure differs subtly in acidic and alkaline solutions. This allows it to be used as an indicator. When added to acids, it remains yellow. 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 effects

Researchers have observed anti-inflammatory, anti-oxidant and anti-cancer properties of curcumin 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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