

Mood Rings



Dark blue: Happy, romantic or passionate

Blue: Calm or relaxed

Blue-green: Somewhat relaxed

Green: Normal or average

Amber: A little nervous or anxious

Gray: Very nervous or anxious

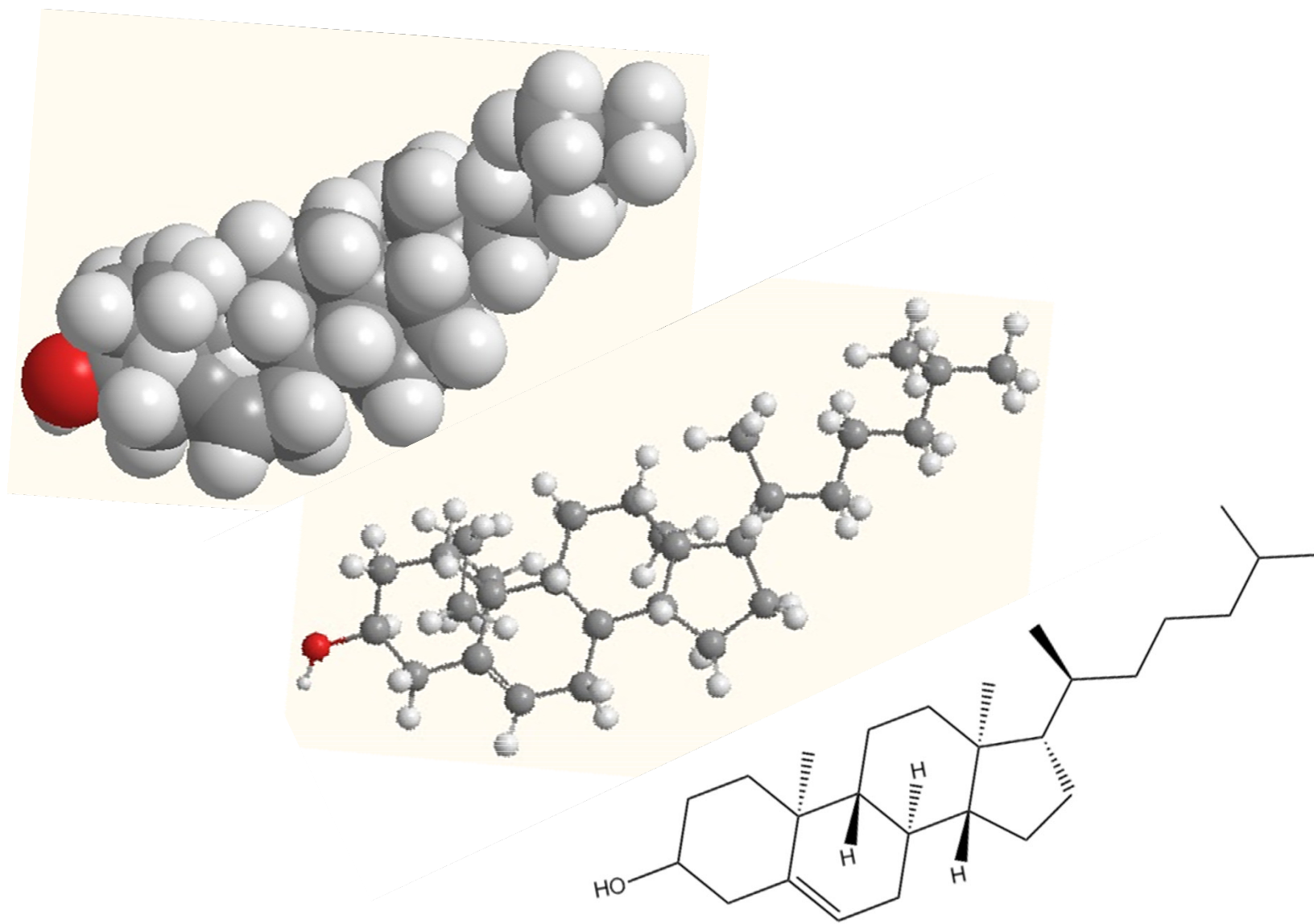
Black: Stressed, tense or feeling harried



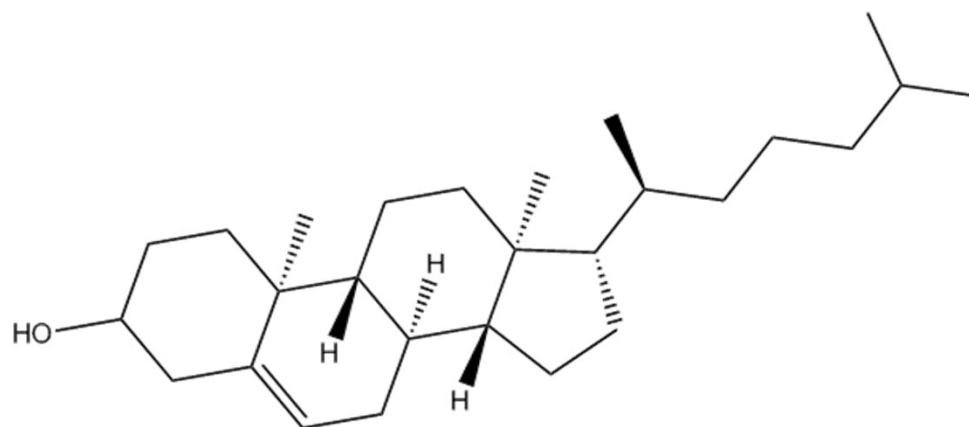
Liquid Crystals



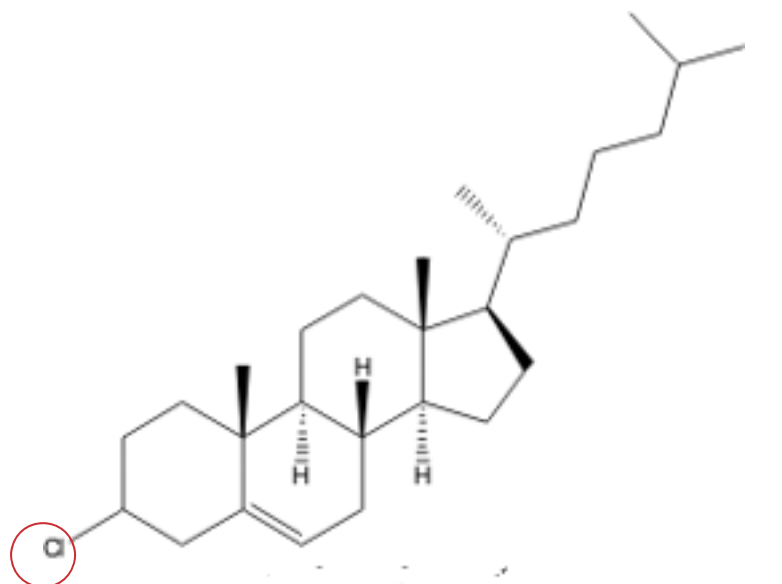
Cholesterol



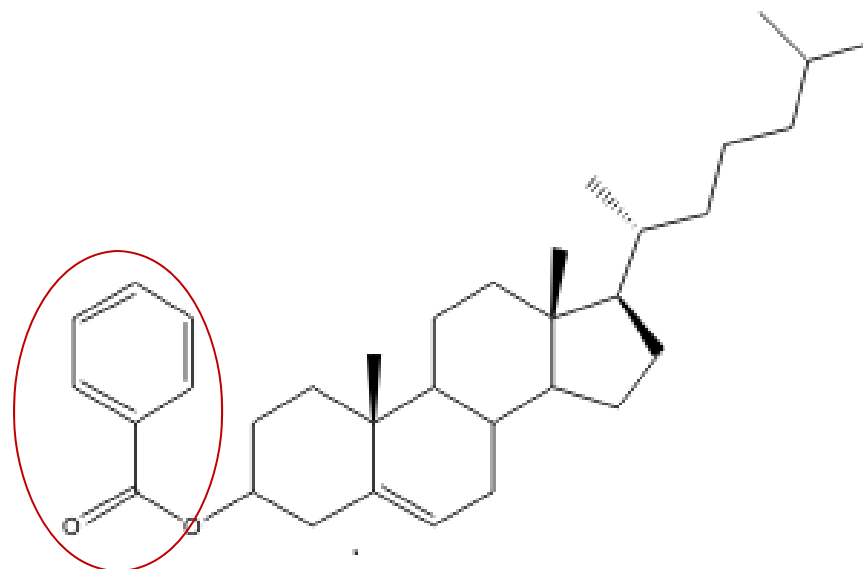
Cholesterol Liquid Crystals



cholesterol

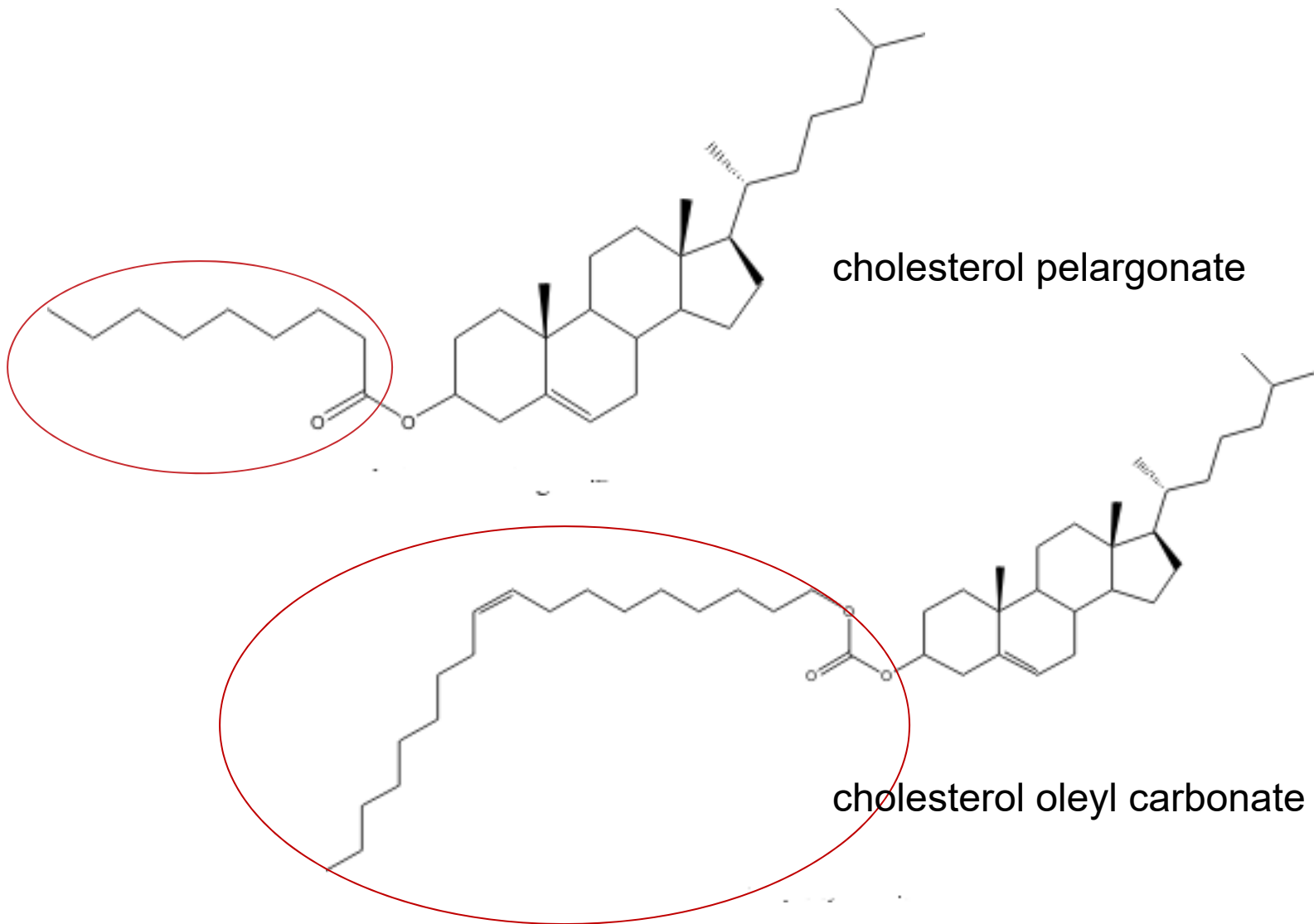


cholesterol chloride



cholesterol benzoate

Cholesterol Liquid Crystals



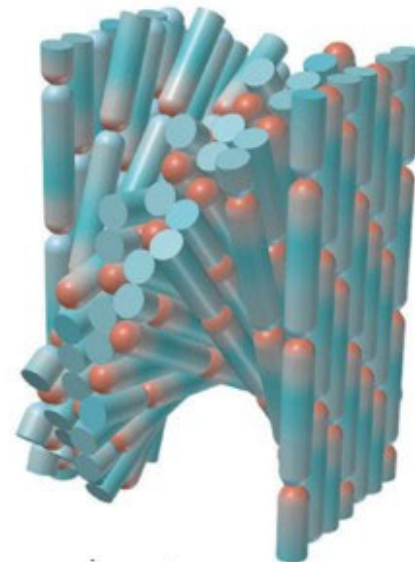
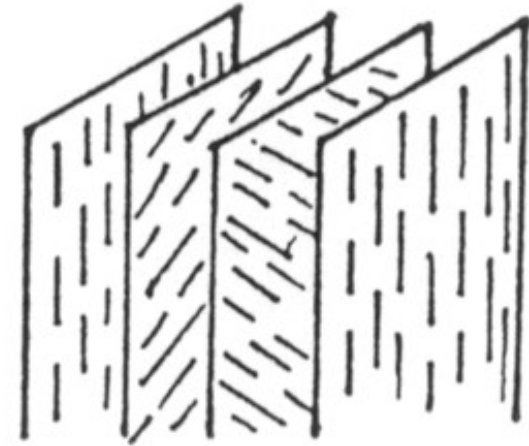
Types of Cholesteryl Liquid Crystals

Lyotropic

Molecules consist of a nonpolar hydrocarbon chain with a polar head group.

In a solvent, such as water, the water molecules are sandwiched between the polar heads of adjacent layers while the hydrocarbon tails lie in a nonpolar environment.

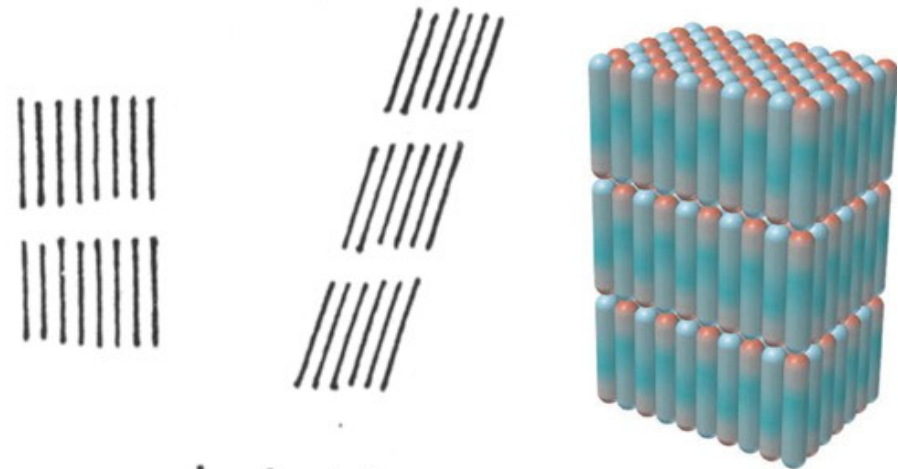
These tend to be pressure and temperature sensitive



Types of Cholesteryl Liquid Crystals

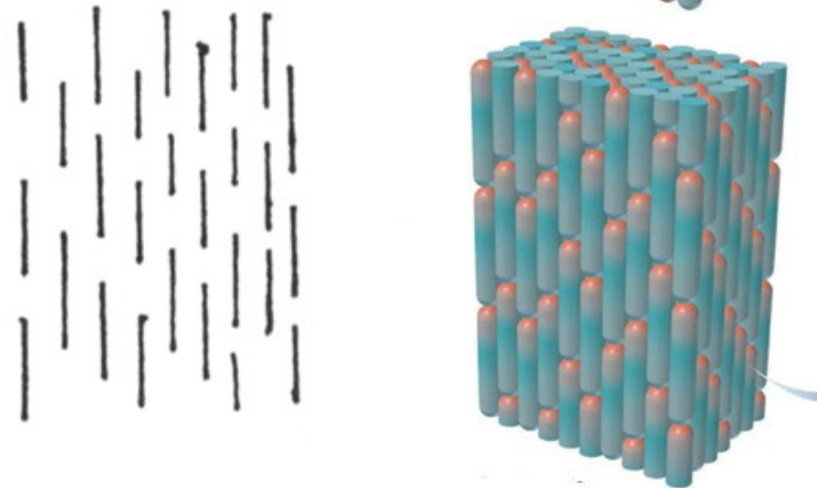
Smectic

Molecules arranged in horizontal layers or strata and are standing on end either vertically or at a tilt.



Nematic

Molecules possess a high degree of long-range order with their long axes approximately parallel, but without the distinct layers of the smectic crystals.



These are temperature sensitive

How does the mood ring work?

The ring conducts heat from your finger to the liquid crystals in the "stone."

The color **green**, signifies "average", it is the approximate **surface temperature** of a typical person, 82°F (28°C).

If your surface temperature varies, then the liquid crystals in the stone alter enough to cause a change in the color reflected.

If you take a mood ring off, it will normally change to black unless the ambient temperature is very high.

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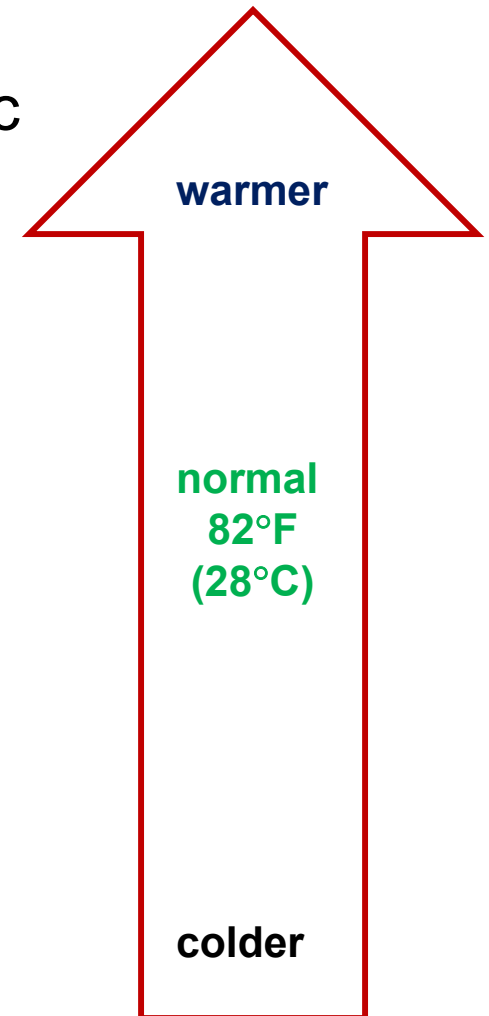
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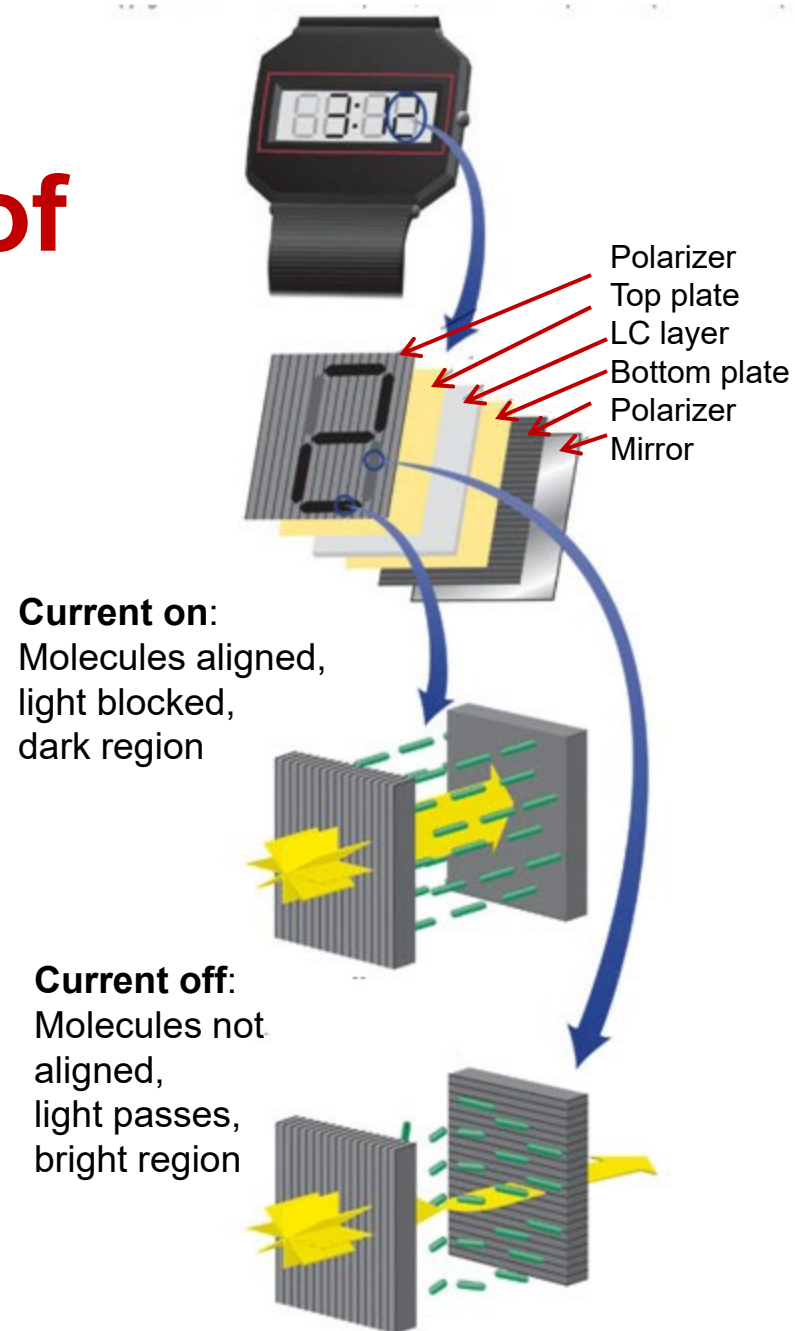
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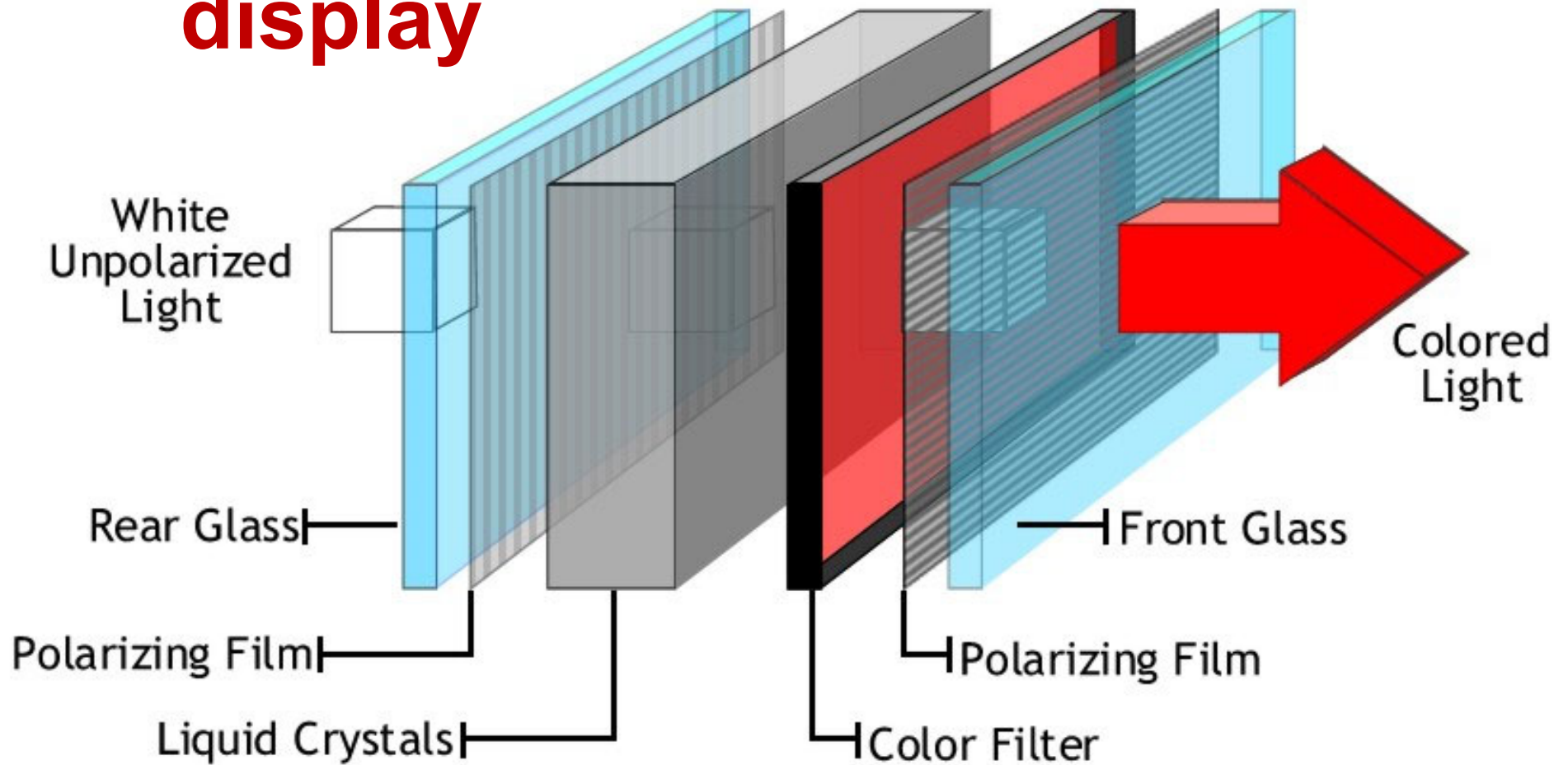
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Schematic of an LCD watch display



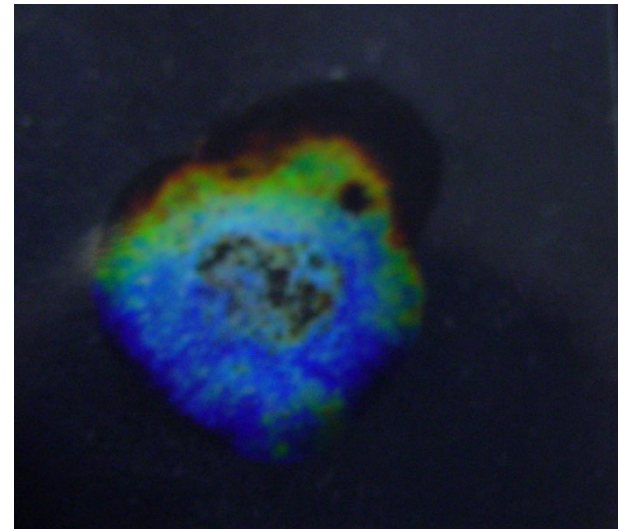
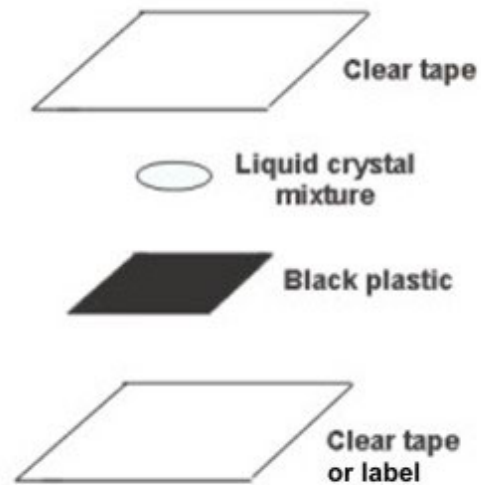
Schematic of an LCD TV display



Liquid crystal mixtures



How to make a liquid crystal display



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