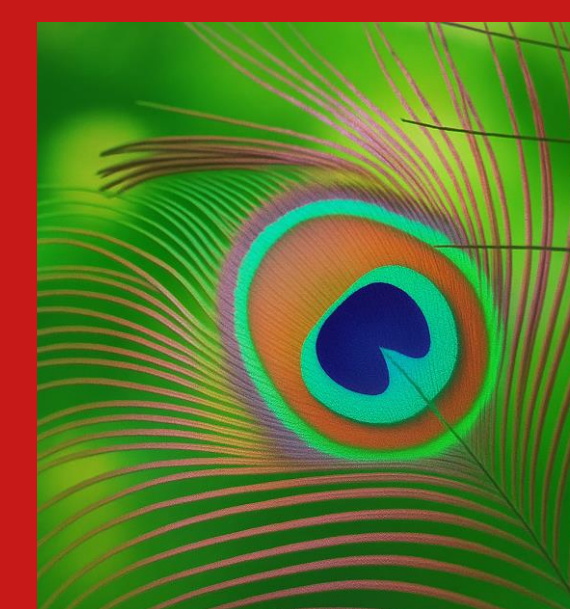


UV-Curable Liquid Crystal-Based Structural Color Inks



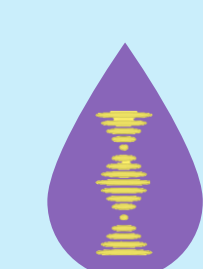
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The Future of Color: Inspired by Nature, Driven by Innovation

Structural colors—like those in butterfly wings and peacock feathers—are created by the interaction of light with nanostructures. They're stable and free of toxic dyes. However, it's still challenging to create coating using structural colored inks.



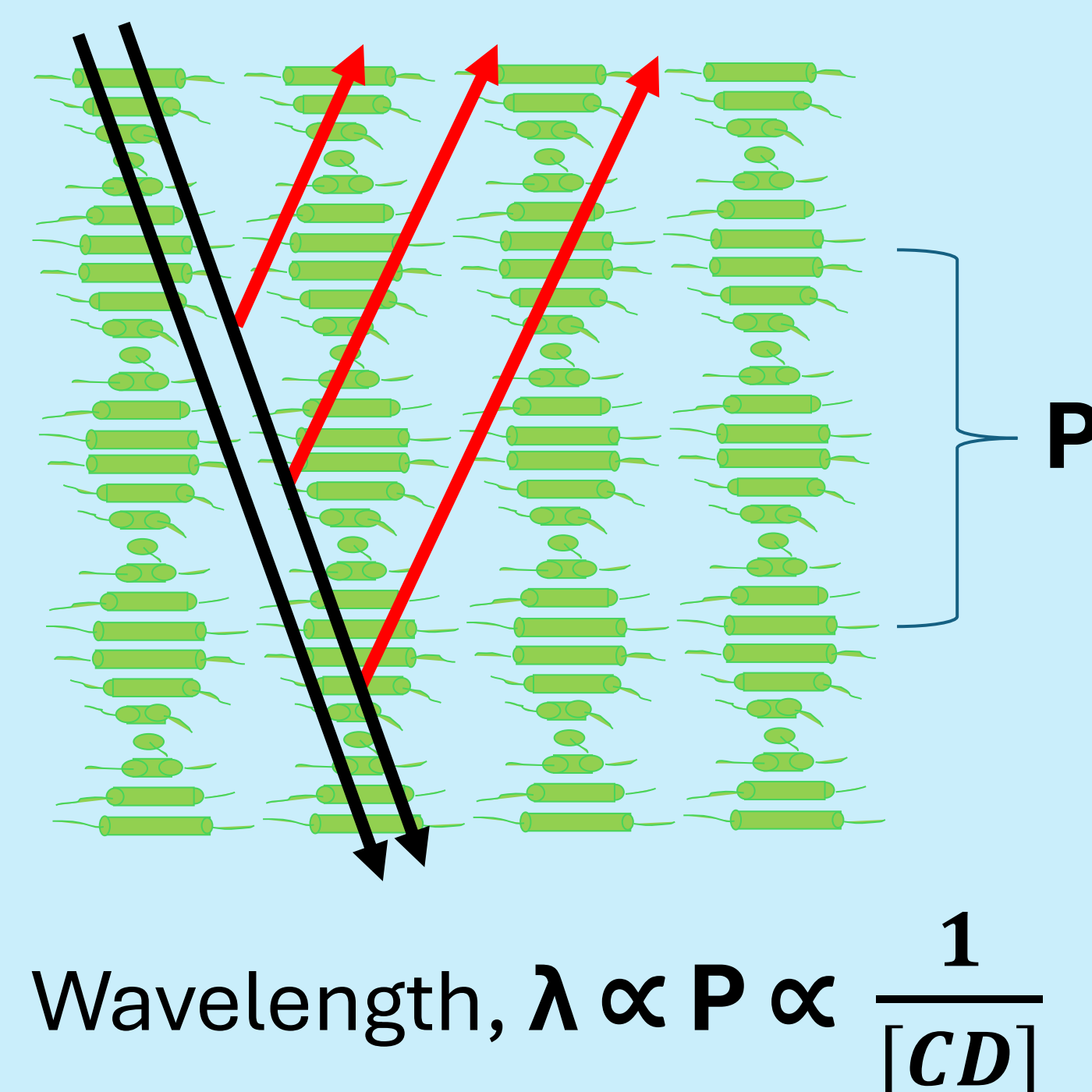
Cholesteric Liquid Crystals based Structural Color Inks

Here we report solvent-free, UV-curable cholesteric liquid crystal (CLC) structural color inks. These inks use self-organized helical structures to create color, tunable by adjusting chiral dopant (CD) concentrations.

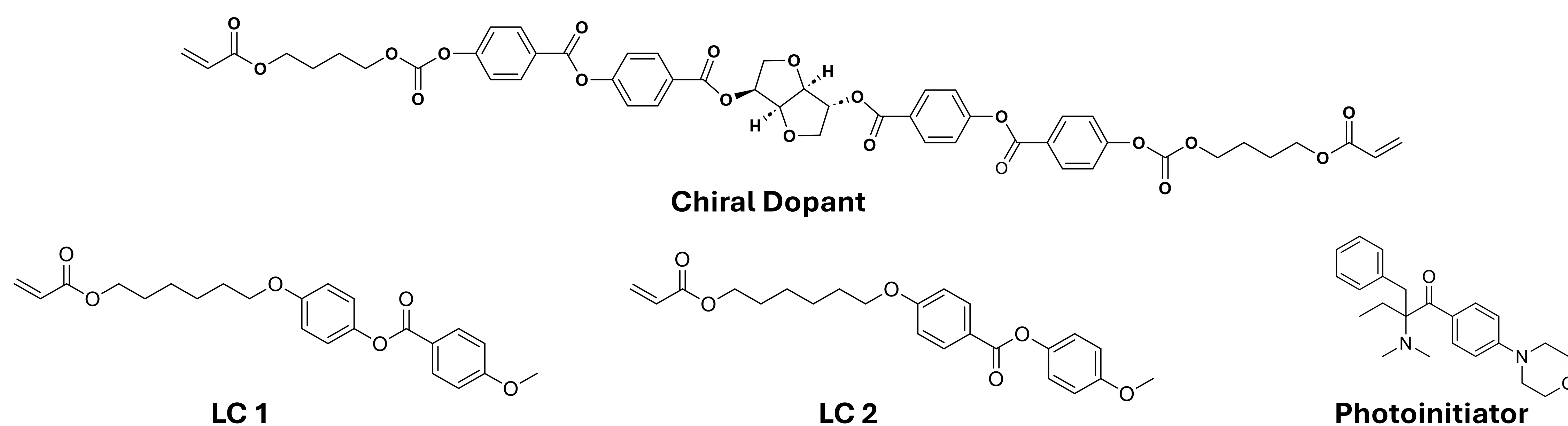


A Greener Tomorrow: Overcoming Challenges

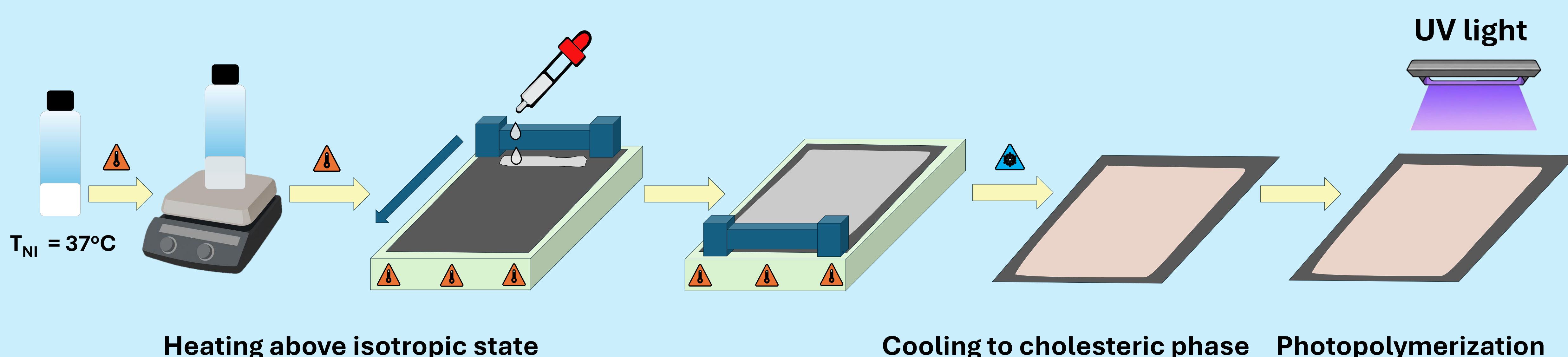
Solvent-free systems eliminate VOCs, making them safer and more sustainable. The challenges arise from high viscosity and elevated temperature requirements, which hinder processability, molecular alignment, uniform film formation, and efficient photocuring.



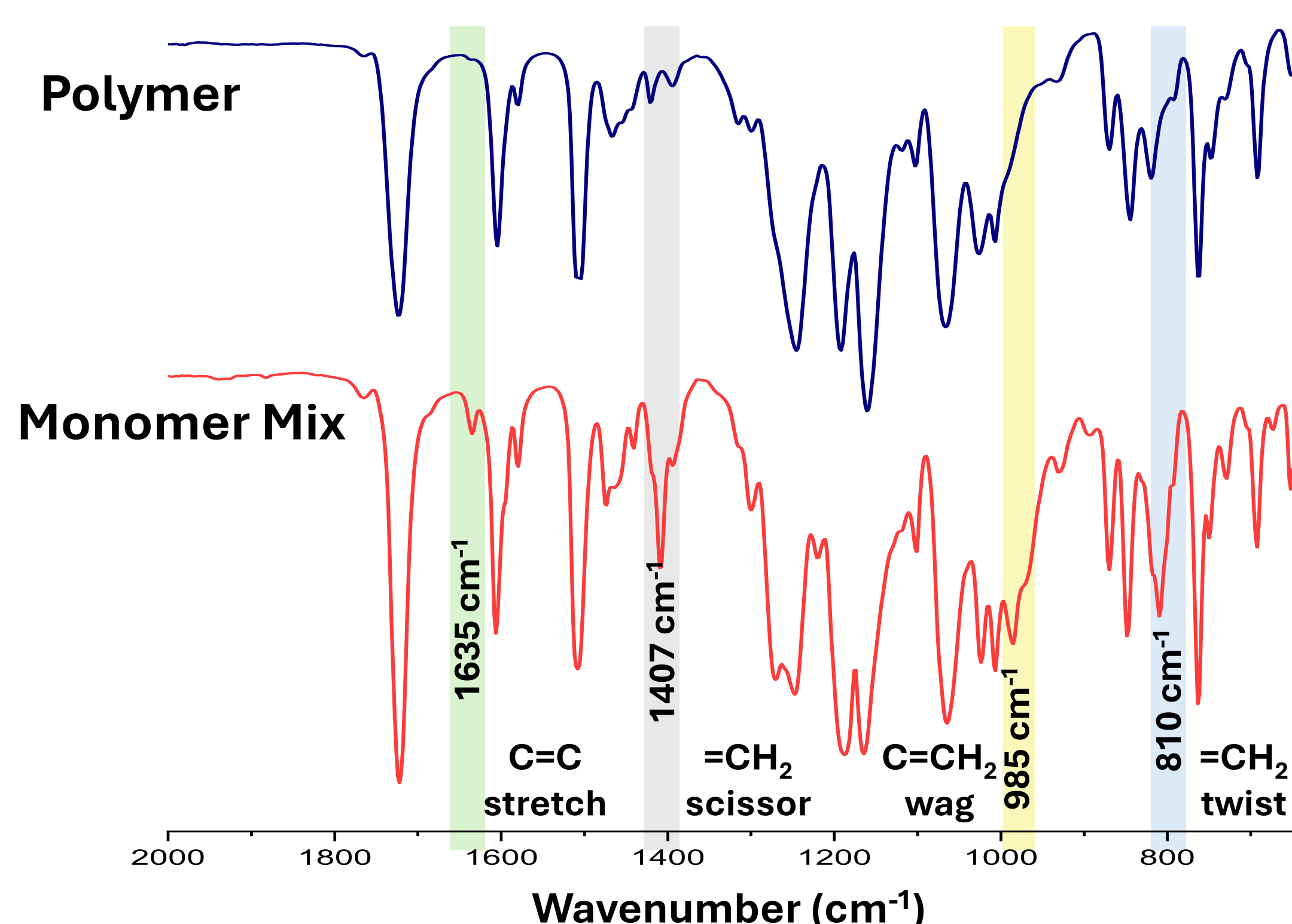
UV-curable CLC Mixture used for Structural Color Inks:



Solvent-free Bar Coating Procedure:

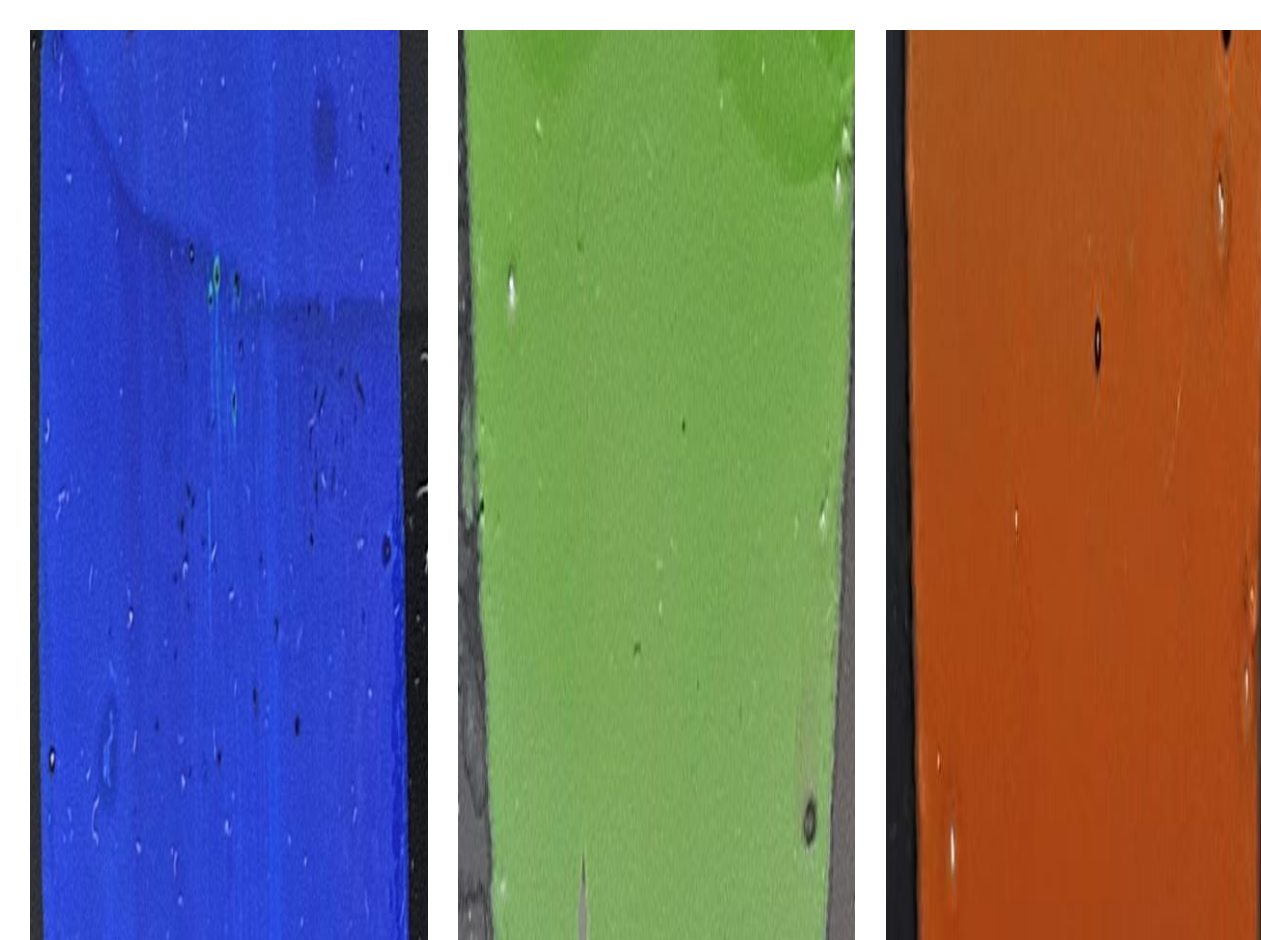


Complete Conversion

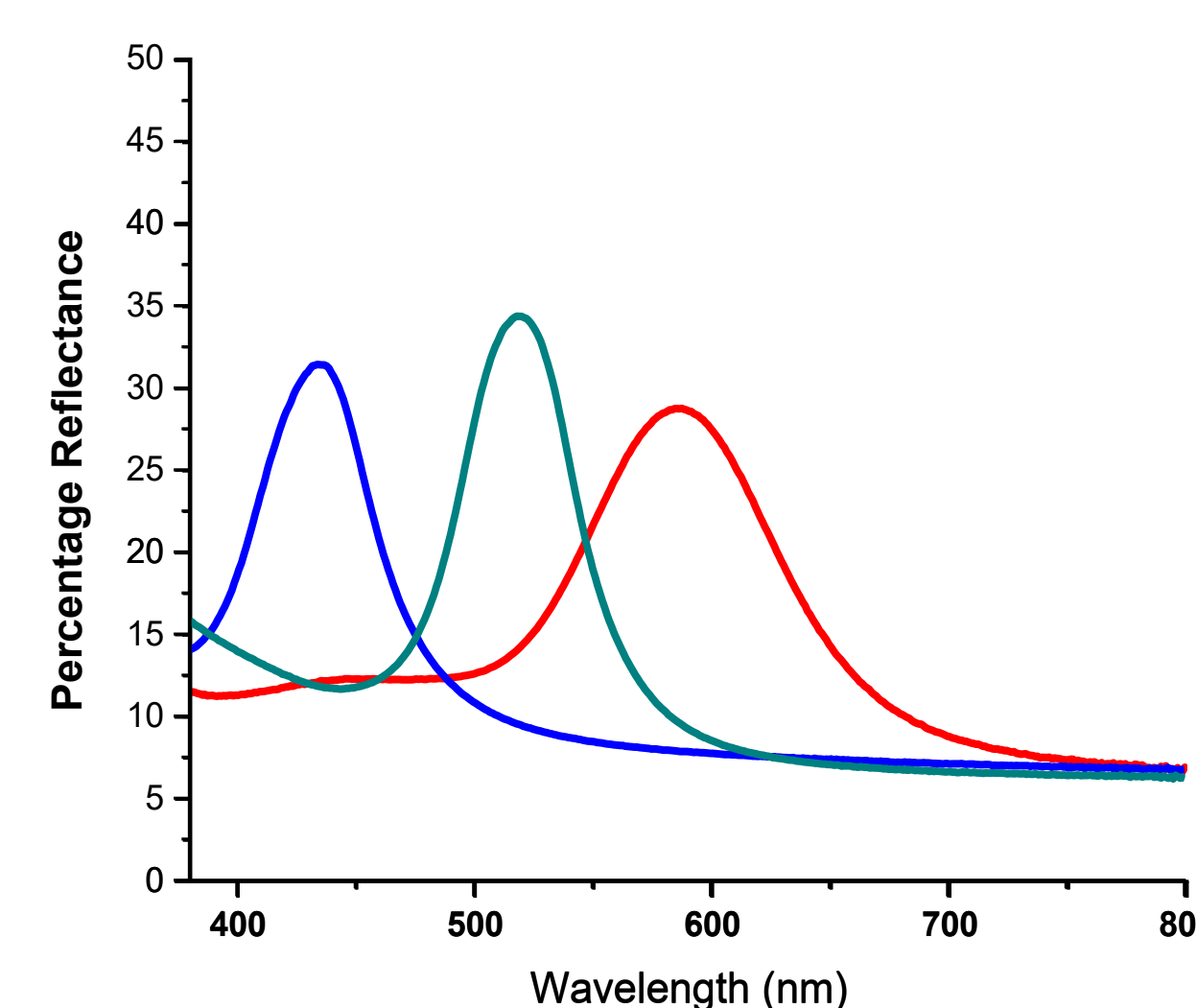


Color Tunability

Structural color coatings



Reflectance Spectra



Decreasing concentration of CD

Conclusions & Outlook:

- ✓ This work demonstrates a scalable approach to producing uniform, color-tunable structural coatings using a solvent-free, UV-curable system
- Further viscosity measurements will be conducted and will aim to develop inkjet-printable formulations and multilayered coatings.



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