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## Formulating with Self-Emulsifying Cream Bases: Kolliphor® CSL

Kolliphor® CSL (cetostearyl alcohol, sodium lauryl sulfate, and sodium cetostearyl sulfate) is an emulsifier and structuring agent combination product that is suitable for O/W (oil-in-water) formulations.

Its strategically designed self-emulsifying properties allow it to be **used in conjunction with a large spectrum of emollients** including, but not limited to, Kollicream® 3 C (cocoyl caprylocaprate, coco-caprylate/caprate), Kollicream® OA (oleyl alcohol), and Kollicream® IPM (isopropyl myristate). When used alongside another emulsifier such as Kolliphor® CSS (sodium cetostearyl sulfate), Kolliphor® CSL's emulsifying properties become amplified to allow this material to efficiently form robust topical semisolids. Kolliphor® CSL can be **processed using a wide range of formulating techniques** such as the direct conventional method and liquid crystalline lamellar gel method.



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## Kolliphor® CSL cream

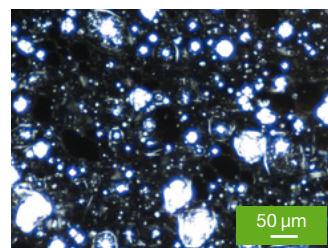
Phase	Ingredient	Wt/wt %
A	Deionized water	75
B	Xanthan gum	0.1
	EuXYL™ K 712	1.5
C	Kolliphor® CSL	6
	Kolliphor® CSS	2.4
D	Kollicream® IPM	15

### Procedure:

1. Heat A to 95 °C.
2. Premix B and add to A while mixing using an overhead mixer.
3. Add C to A/B until combined while mixing at a slow speed.
4. Test for homogeneity, ensuring the mixture doesn't separate.
5. Once fully combined, remove heat and continue to mix until cooled to room temperature.
6. Slowly add D, mixing until uniform on slow speed.

## Liquid crystalline formulation

The liquid crystalline lamellar gel network technique can be used to form rich, thick creams with the additional benefit of potentially **improved API delivery**. This processing method includes heating the water phase to a high temperature followed by using the heat of the water phase to melt the room temperature wax and emulsifier. By cooling the formulation to room temperature prior to adding the emollient, this technique allows for the **formation of liquid crystals** in the cream structure via lamellar structures formed by the sulfates' hydrophobic tails which can further aid in API skin penetration.



Liquid crystalline structure under polarized light.

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