

# BioReNuva<sup>®</sup>

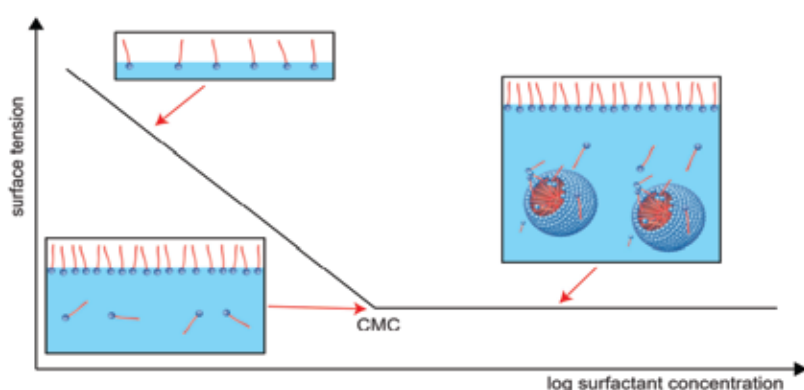
## CRITICAL MICELLE CONCENTRATION (CMC)

**Definition:** The critical micelle concentration (CMC) is the surfactant concentration in a continuous phase above which micelles are formed. When the concentration of surfactant molecules in a solution exceeds the CMC, the surfactant molecules aggregate to form micelles. This is a crucial property for surfactants.

### Surface Tension Measurement:

Method: Surface tension decreases as the surfactant concentration increases. At the CMC, the surface tension reaches a plateau.

Display: Plot of surface tension against the logarithm of surfactant concentration. The CMC is identified at the concentration where the curve levels off.



### CMC Table

ReNuva™ SL-A70	10 mg/L
Polyglycerol-10 Laurate	30 mg/L
Alkyl Polyglucoside	61-87 mg/L
Sodium Lauryl Sulfate	2,300 mg/L
HCO-40	360 mg/L
Cocamidopropyl Betaine	330 mg/L

### Why Does ReNuva™ SL-A70 Have Such a Low CMC?

- (HLB): Sophorolipids possess a balanced hydrophilic (water-attracting) and lipophilic (oil-attracting) nature, which allows them to reduce the surface tension of water effectively at lower concentrations.
- Molecular Structure: Sophorolipids consist of a sophorose sugar moiety linked to a fatty acid. The large hydrophilic head group increases the molecule's ability to interact with water, enhancing its solubility and surface activity.
- Natural Origin and Biocompatibility: Sophorolipids are biosurfactants produced by yeast. Their natural origin results in structures that are more efficient in forming micelles due to evolutionary optimization for specific functions.
- Low Surface Tension Reduction: Sophorolipids are highly effective at lowering the surface tension of water. This high efficiency means fewer molecules are needed to achieve significant surface activity, leading to a low CMC.

### Why Is A Low CMC Important?

- Economic Efficiency: Low CMC means that lower concentrations of sophorolipids are required to achieve desired surfactant effects, which can be cost-effective in industrial applications.
- Environmental Benefits: Using lower amounts of surfactants reduces the environmental impact, making sophorolipids more sustainable and eco-friendly.
- Performance in Formulations: Low CMC contributes to the stability and effectiveness of formulations in personal care, cleaning products, and other applications where surfactants are used.

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