

Eco-friendly choline surfactants and detergents with high cold-water solubility

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CHALLENGE

Surfactants are widely used in detergents and various other products. Alkali sulphates and carboxylates up to a fatty acid chain length of C12-14, both ethoxylated or not, are the most commercially important surfactants. However, **especially non-ethoxylated alkali sulphates and carboxylates have noteworthy disadvantages**, such as low water solubility especially at low temperatures, hard-water sensitivity, harshness to skin and a limited range of useable raw materials for their production. Ethoxylated anionic surfactants can amend some of these disadvantages, but are more expensive to produce.

INNOVATION

The present inventions describe the design of **eco-friendly surfactants with high cold-water solubility and surfactant power even in hard water**. The bulky structure of the choline cation prevents crystallization and lowers the Krafft point, i.e. the temperature at which a surfactant becomes effective. As an example, Krafft points are as low as 0°C for choline laureate (C12) and 14°C for choline stearate (C18), thus rendering choline surfactants **ideal for energy-saving cold-water washing detergents**.

Longer chain fatty acids, which show higher solubilizing or cleaning power compared with shorter ones, can be used as starting material for the new surfactants. This **greatly extends the range of possible raw materials** (such as C18 fatty acids from domestic vegetable oils), while conventional manufacturing processes can still be retained. An inventive combination of biodegradable builder and surfactant additionally improves detergency.

The choline surfactants form a superior alternative to conventional compounds (e.g. sodium lauryl sulphate or laureth sulphate) and are ready for use in eco-friendly detergents and household cleaning products.



- ✓ Low-temp washing
- ✓ Excellent cleaning power
- ✓ Eco-friendly
- ✓ Skin-friendly
- ✓ Inexpensive production
- ✓ High solubility
- ✓ Hard water robustness
- ✓ Many fatty acids usable

COMMERCIAL OPPORTUNITIES

Possible applications of the inventive choline surfactants are as:

- Detergents and cleaning agents
- Emulsifiers
- Lubricants
- Gelling and viscosity control agents

DEVELOPMENT STATUS

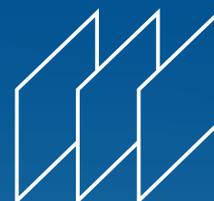
Proof of Concept. Ready to use.

REFERENCE:

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