

Biocompatible cationic aminoacid surfactants

CSIC has developed a new family of biocompatible cationic surfactants derived from histidine with enhanced surface properties, no toxicity and antimicrobial and antifungal activity. These compounds could be used in food, cosmetic, biomedical and pharmaceutical applications.

An offer for Patent Licensing and/or R+D collaboration

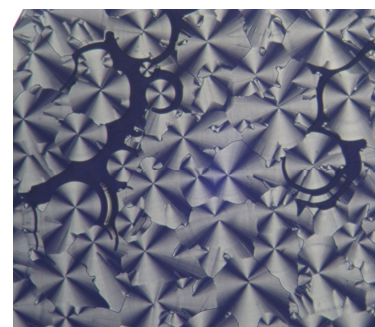
Histidine-based surfactants

Surfactants are one of the most representative chemical products, used in a great number of basic and industrial applications. However, as they can adversely affect aquatic environment, there is an increasing demand for novel environmentally friendly surfactants from renewable resources.

Surfactants derived from amino acids are compounds of great interest due to their "natural" origin, multifunctional capabilities and safety profile. A new family of cationic surfactants based on the histidine aminoacid is presented, showing an enhanced surface-activity and good antimicrobial and antifungal activity comparable to conventional cationic surfactants. These features together with their high biocompatibility make them as perfect candidates to be used in surfactant formulations.

Structurally, these compounds are built by combination of non-polar long chains with histidine to form linear and gemini amphiphilic structures. Both types of structures exhibit a good antimicrobial profile against several bacterial species both Gram-negative and Gram-positive.

Due to their emulsifying and antimicrobial capacity these surfactants could be used as alternatives to conventional surfactants in cosmetic and personal care formulations, in food preservation or in biomedical applications.



Structured gel image of an histidina-based surfactant

Main advantages and applications

The main advantages of this family of surfactants are:

- Simple structure based on renewable raw materials.
- Low toxicity in comparison to classical quaternary ammonium surfactants (QUATS)
- Extraordinary ability to aggregate, with micellization at low concentrations (CMC at μM range).
- Antimicrobial activity tested, showing low levels of minimal inhibitory concentration (MIC) against many Gram-positive and Gram-negative bacteria.
- Potential application as conditioning agents in cosmetic industry, as antistatics and softeners in textile cleaning; as bactericides in food industry (sterilization) or as disinfectants for domestic and hospital use.

Patent Status

Priority patent application filed

For further information please contact

Isabel Masip, Ph.D.
Institute for Advanced Chemistry
of Catalonia
Deputy Vice-Presidency for
Knowledge Transfer of CSIC
Tel: + 34 – 93 400 61 00
E-mail: isabel.masip@iqac.csic.es