

Zwitterionic Surfactants

Zwitterionic (amphoteric) surfactants have both cationic and anionic centers attached to the same molecule. The cationic part is based on primary, secondary, or tertiary amines or quaternary ammonium cations. The anionic part can be more variable and include sulfonates, as in the sultaines CHAPS (3-[(3-cholamidopropyl) dimethylammonio]-1-propanesulfonate) and cocamidopropyl hydroxysultaine. Betaines such as cocamidopropyl betaine have a carboxylate with the ammonium. The most common biological zwitterionic surfactants have a phosphate anion with an amine or ammonium, such as the phospholipids phosphatidylserine, phosphatidylethanolamine, phosphatidylcholine and sphingomyelins.

Usually amphoteric surfactants have low toxicity, antibacterial properties, excellent resistance to hard water, and excellent compatibility with various types of surfactants. Therefore, it can be used as shampoo-purpose foaming agents with high safety, detergent fiber as well as microbicides. Lauryl lactam imidazolium salts are used as the foaming agent of shampoo powder. The amido propyl betaine contained in coconut is also a kind of amphoteric surfactant and can be used for mild shampoos and skin cleansers. Normally, amphoteric surfactants are rarely used alone and are mostly used in compound with fatty alcohol sulfates in order to improve the solubility, reduce the irritation property, increase the viscosity as well as increase the foam stability. Amphoteric surfactants may also be used as the antistatic agents of synthetic fiber as well as metal rust agent.

Amphoteric surfactants are growing in the marketplace as evidence in the chemical industry, textile industry, food and pharmaceutical, and dyes and pigment sector. The lecithin contained in egg yolk belongs to a phospholipid-type amphoteric surfactant and is the only ionic surfactants that can be used in the food industry. It is almost insoluble in water with excellent emulsifying properties of oil. This growth is due to their low toxicity and low irritation on the skin and eyes during the usage process as well as excellent biodegradability, resistance to hard water, emulsifying, dispersing, wetting, foaming, antistatic property, and the high compatibility with all types of surfactants. Amphoteric surfactants can be used as textile finishing auxiliaries, dyeing auxiliaries, dispersants and dry cleaning agents.