FeF® Quats in topical products

Description

Quats are well-known antiseptics and have a long history of use in topical products such as antiseptic liquids, creams and gels. They act on a wide range of microorganisms, from gram+ to gram- bacteria, moulds, yeasts and enveloped viruses such as HIV, herpes and corona. Our FeF® Quats are odourless and colourless, and their effectiveness in all pH ranges combined with their ability to mix well in both aqueous and oily phases, make them an ideal antimicrobial ingredient.

Applications

No matter the application, for formulations coming into contact with either healthy or damaged epithelial tissue, it is necessary to utilize only the purest and safest ingredients.

All our FeF® Quats products are widely used in both human and veterinary topicals. Skin cleansing solutions: FeF® Benzalkonium Chloride (BKC) are used for cleansing skin, mucous membranes, and wounds with a concentration of 0.01 to 0.1%.

Hand sanitizers: Typically the concentration of FeF® Benzalkonium Chloride (BKC) in hand sanitizers is maximum 2% w/w. Standard concentrations in finished products normally vary between 0.5% and 1.5% w/w, and more dilute solutions are suitable for irrigation of deep wounds.

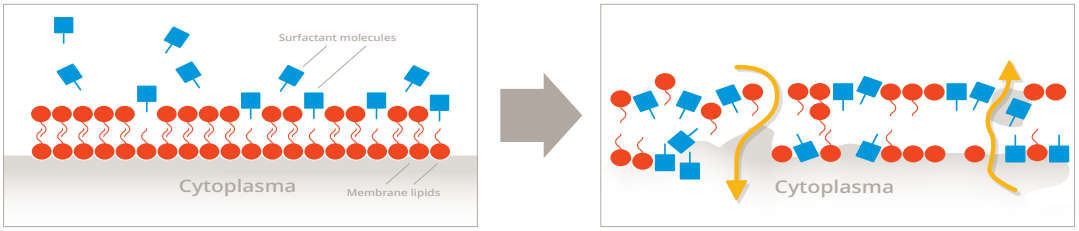
Antiseptic creams: FeF® Benzalkonium Chloride (BKC), FeF® Cetrimide and FeF® CTAB are often found in antiseptic creams used in the treatment of nappy rash, eczema, psoriasis, acne and other dermatoses at concentrations varying from 0.1 to 1%.

Hair products: FeF® Quats are also used in hair products, or example to treat seborrheic dermatitis. Spermicide: FeF® Benzalkonium Chloride (BKC) is widely used in spermicides in foams, creams and ampoules.

Safety and efficacy

Since Quats act on the surface and not on the content of cells, they do not trigger antibiotic resistance. Quats should not be classified as skin sensitizers but as skin irritants. Bromides are less irritating to the skin than chlorides. Quats are relatively non-toxic in use concentrations and only considered harmful in concentrated forms.

Tertiary amines are used in the manufacture of Quats; free amine is a possible impurity and can be responsible for skin irritation. FeF® Quats are carefully manufactured with synthetic raw materials from qualified suppliers, and our validated processes are fully controlled to obtain the lowest possible content of impurities.



Mode of action: The Quats alkyl (fatty) chains have a good affinity for bacterial membranes. Quats disrupt the membrane's structure and provoke leaking of the cytoplasm.

Product characteristics

Solubility: Quats are miscible with water or lower alcohols, such as methanol, ethanol and propanol in all ratios. Quats are not miscible with benzene or ether.

Compatibility: Quats can be combined with e.g. alcohol and chlorhexidine and with the most commonly used compounds in topical formulations. Mixing Quats with ordinary soaps and/or with anionic detergents may decrease the activity. As Quats are cationic compounds, they should not be mixed with anionic compounds which would have a neutralizing effect. Quats can be inhibited by Tween® and by lecithin. Avoid mixing Benzalkonium Chloride (BKC) with citrates, iodides, nitrates, perman ganates, salicylates, silver salts and tartrates. Incompatibilities have also been reported with other substances including aluminium, fluorescin sodium, hydrogen peroxide, kaolin and some sulfonamides.

Stability: 5 years shelf life.

Other: Odourless, Colourless, Easy to formulate, Surface active / adhesive, Non-volatile and very stable.

Antimicrobial effect

FeF® Quats are effective at all pH levels. However their effectiveness increases when the pH increases. The higher the pH, the lower the concentration needed to obtain an antimicrobial effect. As opposed to bacteriostatic/ fungistatic compounds which only prevent micro-organisms from dividing (growing), Quats are bactericidal/fungicidal, meaning they will kill micro-organisms, whether they are in a growth phase or not.

Some antibiotics under given conditions are more effective than antimicrobials. However, in general, they only work if the micro-organism is in a growth phase and so, cannot be used as an antimicrobial. FeF® Quats have been tested against several relevant microbial strains, and shown to be effective against a wide range of micro-organisms at low concentrations. FeF® Quats are compared here with ethanol and with a positive control containing Meropenem (a broad-spectrum antibiotic).

Table 1: Minimal Inhibitory Concentrations. Mean results in % or µg/ml.

Species	ATCC no.	BKC %	CTAB %	Cetrimide %	Ethanol %	Meropenem µg/ml	Control strain/ Meropenem µg/ml	Range of control µg/ml
Candida albicans	2091	< 0.001	< 0.001	0.002	>1	>16	-	-
Corynebacteria amycolatum	CCUG 33685	0.002	0.004	0.004	>1	0.006	0.006	0.06-0.25
Streptococcus dysgalactiae	12394	< 0.001	< 0.001	0.002	>1	< 0.015	0.06	0.06-0.25
Enterococcus faecalis	29212	< 0.001	< 0.001	< 0.001	>1	0.125-8	0.125-8	2-8
Staphylococcus aureus MRSA	33591	< 0.001	< 0.001	< 0.001	>1	16	-	-
Staphylococcus aureus	29213	< 0.001	< 0.001	< 0.001	>1	0.06	0.06	0.03-0.12
Pseudomonas aeruginosa	27853	0.008	0.063	0.016	>1	0.5	0.5	0.25-1
Mycobacterium abcsessus NFM32	-	< 0.001	< 0.001	< 0.001	>1	< 0.001	-	-
Acinetobacter baumannii	19606	0.002	0.002	0.008	>1	1	-	-
Staphylococcus epidermidis	12228	< 0.001	< 0.001	< 0.001	>1	0.06	-	-
Staphylococcus lugdunensis	70328	< 0.001	< 0.001	< 0.001	>1	0.25	-	-

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