# OPS® INSTANT Hand Sanitizer

## BENZALKONIUM CHLORIDE

Benzalkonium chloride (alkyl dimethyl benzyl ammonium chloride) is a mixture of alkylbenzyl dimethylammonium chlorides of various alkyl chain lengths. It is commonly used as an **antiseptic** and **spermicide**. This product is a nitrogenous **cationic surface-acting agent** belonging to the **quaternary ammonium** group. It is one of the safest synthetic **biocides** known, and has a long history of efficacious use.

Applications are extremely wide ranging, from disinfectant formulations to **microbial corrosion inhibition** in the oilfield sector. It has long been deemed safe for human use, and is widely used in **eyewashes**, hand and face washes, **mouthwashes**, **spermicidal** creams, and in various other cleaners, sanitizers, and **disinfectants**.

Aqueous solutions of benzalkonium chloride are neutral to slightly **alkaline**, colorless, and non-staining. Solutions **foam** profusely when shaken; have a bitter taste, and a faint almond-like odor, which is only detectable in concentrated solutions. The mechanism of bactericidal/microbicidal action is thought to be due to disruption of intermolecular interactions.

This can cause dissociation of **cellular membrane** bilayers, which compromises cellular permeability controls and induces leakage of cellular contents. Other biomolecular complexes within the bacterial cell can also undergo dissociation. **Enzymes**, which finely control a plethora of respiratory and metabolic cellular activities, are particularly susceptible to deactivation. Critical intermolecular interactions and **tertiary structures** in such highly specific biochemical systems can be readily disrupted by cationic surfactants.

Benzalkonium chloride solutions are rapidly acting anti-infective agents with a moderately long duration of action. They are active against **bacteria** and some **viruses**, **fungi**, and **protozoa**. Bacterial **spores** are considered to be resistant. Solutions are **bacteriostatic** or **bactericidal** according to their concentration. **Gram-positive** bacteria are generally more susceptible than **gram-negative**.

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