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## Product Information

### BENZALKONIUM

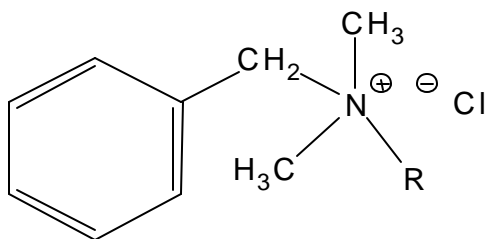
Product Code **23,442-7**

Store at Room Temperature

Replacement for Product Number **B1383**

CAS #: 63449-41-2

Synonyms: Alkyl Dimethylbenzyl Ammonium Chloride;  
Alkyldimethyl(phenylmethyl) Quaternary Ammonium  
Chlorides; Ammonyx; Arquad DMMCB-75; Barquat  
MB-50; Bayclean; Benirol; Benzalkonium A; Empigen;  
Roccal; Zephiran Chloride



### Product Description

Appearance: white to yellow semisolid- to yellow liquid

Structure:  $[C_6H_5CH_2N(CH_3)_2R]Cl$  where R is

predominantly  $n-C_{12}H_{25}$

(product also contains  $C_{14}$  and  $C_{16}$  homologs)<sup>1</sup>

Molecular weight (approx.): 360<sup>2</sup>; 375 by perchloric acid  
titration<sup>3</sup>

Melting point: 34-37 °C<sup>4</sup>

Benzalkonium chloride (BC) is a quaternary ammonium salt with antiseptic properties and uses similar to other cationic surfactants. The mode of action of quaternary ammonium compounds appears to be associated with the agent's effect on the cytoplasmic membrane, which controls cell permeability. Extensive data are reported for effective concentrations and affected bacterial species.<sup>7</sup> BC is not effective against gram-negative bacteria or picornaviruses, and is not recommended for treatment of sanitizing critical or semicritical medical instruments.<sup>8</sup> It has been reported that BC inactivates HIV and HSV *in vitro*.<sup>6</sup> Usage concentrations range from 0.01% to 0.1% for cleansing of wounds and skin surfaces.

Benzalkonium chloride is reportedly **incompatible** with soaps and other anionic surfactants, citrates, iodides, nitrates, permanganates, salicylates, silver salts and tartrates. Incompatibilities have been demonstrated with ingredients of some commercial rubber mixes or plastics. Incompatibilities have also been reported with other substances including aluminum, **cotton**, fluorescein sodium, hydrogen peroxide, kaolin, hydrous wool fat, and some sulphonamides.<sup>6,8</sup> The preservative effect of BC can be neutralized by the addition of Tween 80 and lecithin.<sup>9</sup>

### Preparation Instructions

This product gives a clear colorless to faint yellow solution at 1 g plus 10 mL of water. It is also very soluble in alcohol and acetone, slightly soluble in benzene, almost insoluble in ether.<sup>5</sup> Solutions may be sterilized by autoclaving or filtration.<sup>6</sup>

### Storage/Stability

When stored as indicated Benzalkonium has a shelf-life of two years.

### References

1. Sigma's supplier.
2. United States Pharmacopoeia, vol. XXII, p. 1905 (1990).
3. Sigma quality control.
4. Fluka information.
5. *Merck Index*, 11th ed., p. 165, #1066 (1989).
6. *Martindale: The Extra Pharmacopoeia*, 27th ed., p. 501; 31st ed., p. 1117 (1996).
7. *Disinfection, Sterilization and Preservation*, 4th ed., Block, S. Ed. (Lea & Febiger, 1991). Chapter 13, 225-255.
8. *Disinfection, Sterilization and Preservation*, 4th ed., p. 633.
9. *Disinfection, Sterilization and Preservation*, 4th ed., p. 884.

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