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21 Authors

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22 Date of Revision

4 May 2017.

Cetrimonium Bromide

1 Nonproprietary Names

USP–NF: Cetrimonium Bromide

2 Synonyms

Acetoquat CTAB; Bromat; CETAB; Cetavlon; cetrimide BP 1953; cetyltrimethylammonium bromide; Cetylamine; CTAB; hexadecyltrimethylammonium bromide; HTAB; Lissolamine; Micol; Quamonium; *N,N,N*-trimethyl-1-hexadecanaminium bromide (1:1); *N,N,N*-trimethylhexadecylammonium bromide; palmityltrimethylammonium bromide; *RonaCare*.

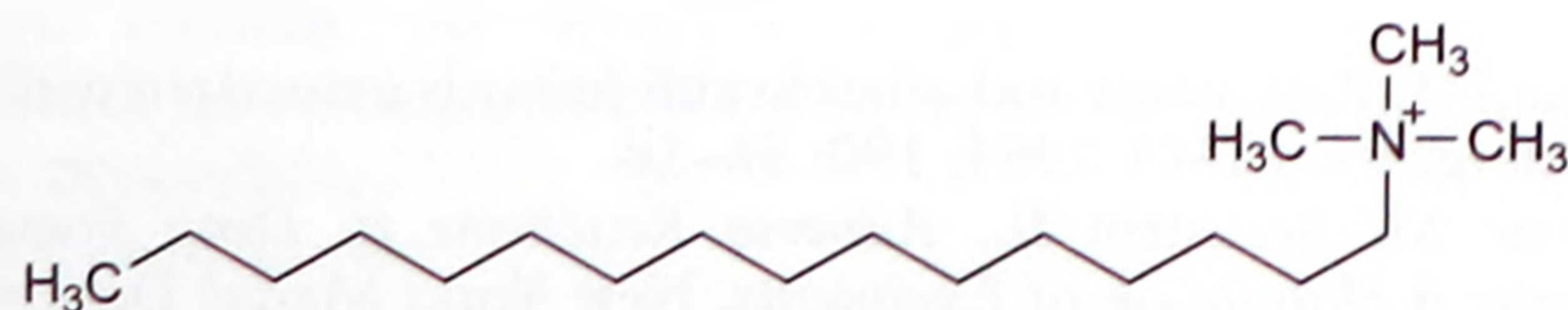
3 Chemical Name and CAS Registry Number

Hexadecyltrimethylammonium bromide [57-09-0]

4 Empirical Formula and Molecular Weight

$C_{19}H_{42}BrN$ 364.45

5 Structural Formula



6 Functional Category

Antimicrobial preservative; cationic surfactant.

7 Applications in Pharmaceutical Formulation or Technology

Cetrimonium bromide is a cationic quaternary ammonium compound used as an antimicrobial preservative and cationic surfactant in topical pharmaceutical preparations.^(1–4) It has also been used in suppository formulations,⁽⁵⁾ and in microemulsions or nanoparticles for controlled drug delivery.^(6–12)

Cetrimonium bromide has been investigated in the synthesis of gold nanoparticles for the detection and treatment of cancers by controlled drug release.⁽¹³⁾

8 Description

Cetrimonium bromide occurs as a white powder or crystals, with a characteristic faint odor.

9 Pharmacopeial Specifications

See Table I.

Table I: Pharmacopeial specifications for cetrimonium bromide.

Test	USP 40–NF 35 S1
Identification	+
Acidity or alkalinity	+
Appearance of solution	+
Amines and amine salts	+
Loss on drying	≤2.0%
Residue on ignition	≤0.5%
Microbial limits	
Aerobic microbial count	≤10 ³ cfu/g
Yeasts and molds	≤10 cfu/g
Assay (as $C_{17}H_{38}BrN$, dried basis)	96.0–101.0%

10 Typical Properties

Acidity/alkalinity pH = 5.0–7.0 for a 3.64% w/v aqueous solution at 25°C

Antimicrobial activity Cetrimonium bromide is active at alkaline pH against both Gram-positive and Gram-negative organisms.⁽¹⁴⁾ Its activity is neutralized by soaps and anionic detergents, such as sodium dodecyl sulfate (SDS). Typical minimum inhibitory concentrations (MICs) are shown in Table II.⁽¹⁾

Critical micelle concentration (CMC) 0.92 to 1.0 mM (water)⁽¹⁵⁾