

- 35 Fukushima S, *et al.* Effect of cetostearyl alcohol on stabilization of oil-in-water emulsion, II. Relation between crystal form of the alcohol and stability of the emulsion. *J Colloid Interface Sci* 1977; 59(1): 159–165.
- 36 Realdon N, *et al.* Influence of processing conditions in the manufacture of O/W creams II. Effect on drug availability. *Il Farmaco* 2002; 57: 349–353.

20 General References

- BASF. Product literature: *Kollivax* grades, August 2012.
- Ceresole R, *et al.* Drug-excipient compatibility studies in binary mixtures of avobenzone. *J Cosmet Sci* 2013; 64: 317–328.
- European Commission – European Chemicals Bureau. IUCLID Chemicals Datasheet: Substance ID 67762-27-0, Alcohols C16–18, February 2000.

- Savić S, *et al.* Natural surfactant-based topical vehicles for two model drugs: Influence of different lipophilic excipients on *in vitro* and *in vivo* skin performance. *Int J Pharm* 2009; 381(2): 220–230.

21 Authors

S Shah, S Cantor.

22 Date of Revision

4 May 2017.

Cetrimide

1 Nonproprietary Names

BP: Cetrimide

PhEur: Cetrimide

2 Synonyms

Cetavlon; *Cetraol*; cetrimidum; *Lissolamine V*; *Micol*; *Morpan CHSA*; *Morphans*; *Quammonium*; *Sucticide*.

3 Chemical Name and CAS Registry Number

Cetrimide [8044-71-1]

Note that the above name, CAS Registry Number, and synonyms refer to the PhEur 9.2 material which, although it consists predominantly of trimethyltetradecylammonium bromide, may also contain smaller amounts of other bromides; *see* Section 4.

There is some confusion in the literature regarding the synonyms, CAS Registry Number, and molecular weight applied to cetrimide. Chemical Abstracts has assigned [8044-71-1] to cetrimide and describes that material as a mixture of alkyltrimethylammonium bromides of different alkyl chain lengths. Different CAS Registry Numbers have been assigned to the individual pure components. While these numbers should not be interchanged, it is common to find the molecular weight and CAS Registry Number of trimethyltetradecylammonium bromide [1119-97-7] used for cetrimide, as this is the principal component, defined in both the BP 2017 and PhEur 9.2. It should be noted however, that the original BP 1953 described the principal component of cetrimide as hexadecyltrimethylammonium bromide.

The CAS Registry Number for hexadecyltrimethylammonium hydroxide [505-86-2] has also been widely applied to cetrimide. Therefore, careful inspection of experimental details and suppliers' specifications in the literature is encouraged to determine the specific nature of the 'cetrimide' material used in individual studies.

See Section 17 for further information.

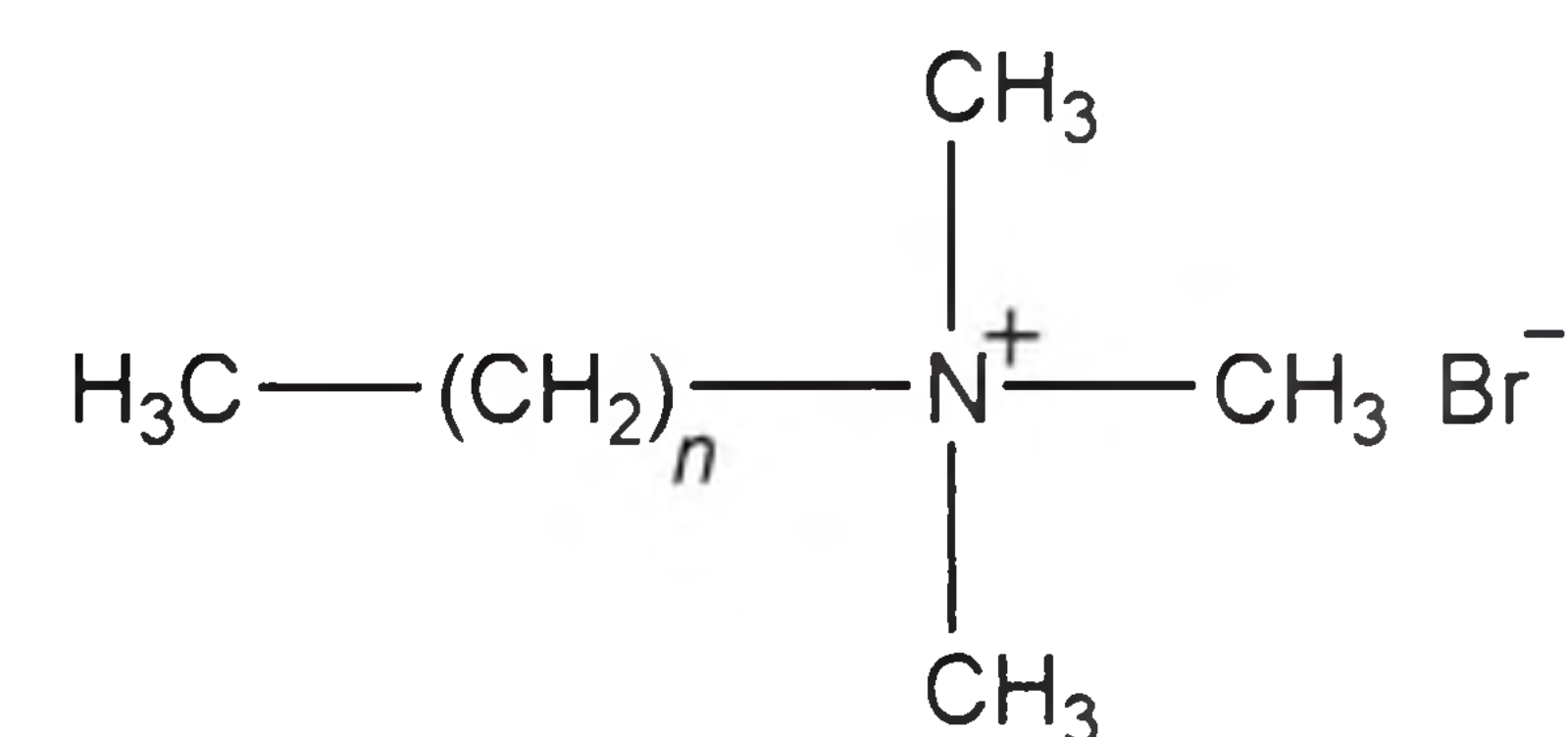
4 Empirical Formula and Molecular Weight

Cetrimide consists mainly of trimethyltetradecylammonium bromide (C₁₇H₃₈BrN), and may contain smaller amounts of dodecyltrimethylammonium bromide (C₁₅H₃₄BrN) and hexadecyltrimethylammonium (cetrimonium) bromide (C₁₉H₄₂BrN).

C₁₇H₃₈BrN 336.40

See also Section 17.

5 Structural Formula



where

$n = 11$ for dodecyltrimethylammonium bromide

$n = 13$ for trimethyltetradecylammonium bromide

$n = 15$ for hexadecyltrimethylammonium (cetrimonium) bromide

6 Functional Category

Antimicrobial preservative; cationic surfactant.

7 Applications in Pharmaceutical Formulation or Technology

Cetrimide occurs as a quaternary ammonium compound that is used in cosmetics and pharmaceutical formulations as an antimicrobial preservative; *see* Section 10. It may also be used as a cationic surfactant. In eye-drops, it is used as a preservative at a concentration of 0.005% w/v.

Cetrimide is also used as a cleanser and disinfectant for hard contact lenses, although it should not be used on soft lenses. It is an ingredient of cetrimide emulsifying wax, and is used in o/w creams (e.g. cetrimide cream) and emulsions.⁽¹⁾

8 Description

Cetrimide is a white to creamy white, free-flowing powder, with a faint but characteristic odor and a bitter, soapy taste.

9 Pharmacopeial Specifications

See Table I.

10 Typical Properties

Acidity/alkalinity pH = 5.0–7.5 (1% w/v aqueous solution)

Antimicrobial activity Cetrimide has good bactericidal activity against Gram-positive species but is less active against Gram-negative species. *Pseudomonas* species, particularly *Pseudomo-*