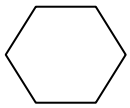
7.3 Solubility of Amines

Amines are similar to alcohols in terms of their solubility. One polar amine group can pull about 4 C atoms of hydrophobic alkyl chain into water.

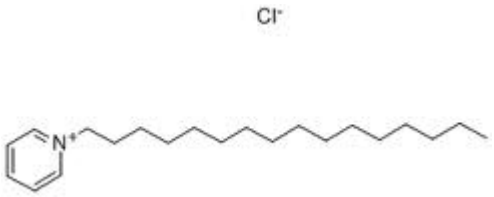
$CH_3CH_2CH_2NH_2$  NH_2

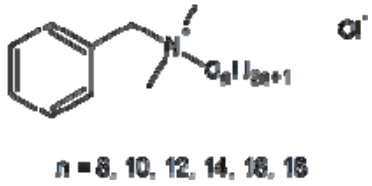
1 aminopropane
very soluble in water.

1-aminocyclohexane (cyclohexylamine)
not very soluble in water

When an amine is converted into an **alkylammonium** ion (by the addition of acid) the ionic ammonium ion is much more effective at pulling non-polar groups(up to ~15-18 C atoms) into aqueous solution, just as was the case for carboxylate ions. They do this by forming micelles, just like the carboxylate ions.

Several germicidal detergents use ammonium ion based detergents.





Cetylpyridinium chloride
(Cepacol mouthwash)

Benzalkonium chloride (Zephiran)
topical antiseptic and hair conditioners

Hair conditioners also contain positively charged benzalkylammonium ions which stick to the negatively charged surface of hairs and coat the hair, reducing static repulsion between strands of hair and improving the shine of the hair.