

## ANTISEPTICS AND DISINFECTANTS

- Disinfectants and antiseptic are chemical agent which are applied to destroy or inhibit the growth of pathogenic microorganisms in the non-sporing or vegetative state.
- An antiseptic is an agent which prevents sepsis by destroying or inhibiting the growth of microorganisms in the living tissue.

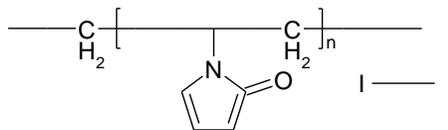
CLASSIFICATION- The disinfectant and antiseptic may be classified into following category.

### A ) – HALOGEN CONTAINING COMPOUNDS

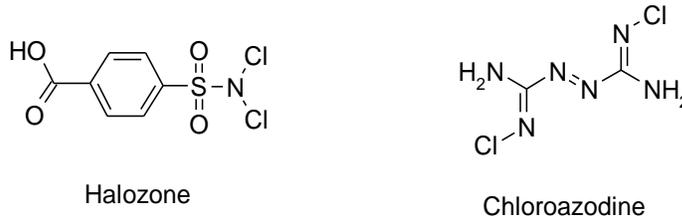
1)– IODOPHORS :- Elemental iodine(I<sub>2</sub>) is the oldest germicide still in use today. Iodine is one of the most effective and useful of the germicide. Mixing with a number of non-ionic and cationic surfactants can solubilize iodine.

Complexes from that retain the germicidal properties of the Iodine while reducing its volatility and its irritant properties. In some of the more active , non-ionic surfactant complexes,it is estimated that approximately 80% of the dissolved iodine remains available in bacteriologically active form. The active form complexes, called iodophors, are both bactericidal and fungicidal.

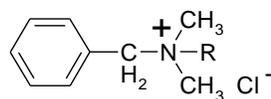
2) – POVIDONE IODINE :- Povidine-iodine ( Betadine ) is a charge transfer complex of iodine with the non-ionic surfactant polymer Polyvinylpyrrolidone ( PVP ).



3) – CHLORIDE CONTAINING COMPOUNDS :-



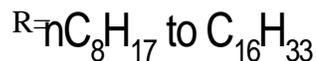
B ) – CATIONIC SURFACTANTS :- All of the cationic surfactants are quaternary ammonium compounds. They are always ionized in water and exhibit surface active properties.



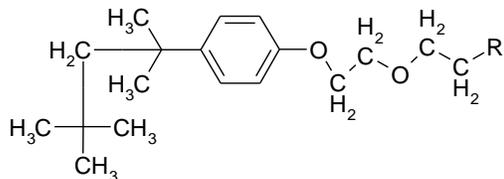
Compound

R

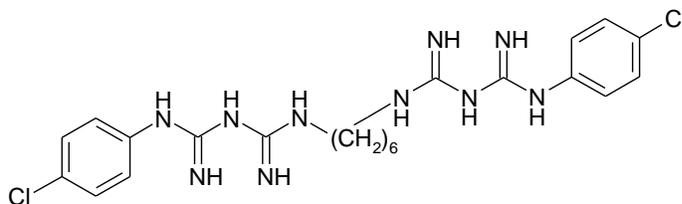
Banzalkonium chloride



Benzethonium chloride



Chlorohexidine

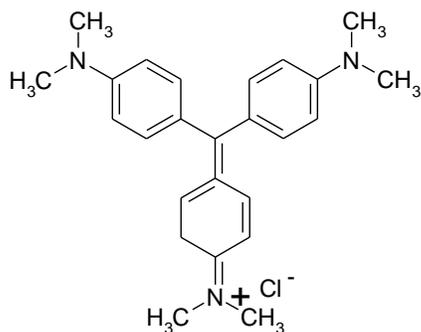


C ) DYES: - Organic dye was used very extensively as anti-infective agents before the discovery of the sulphonamides and the antibiotics. A few cationic dye still find used as anti-infectives. These include Triphenylmethane dye crystal violet (gentian violet ) and basic fuchsin and the thiazine dye methylene blue.

The dyes form colourless leucobase forms under alkaline conditions.

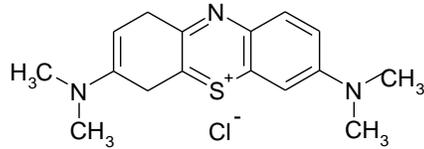
Cationic dyes are active against gram+ve bacteria and many fungi.

Crystal violet :- It is used as topical anti-bacterial agents. It also has antifungal properties.



Basic Fuchsin :- It is a mixture of the chloride of rosaniline and p-rosaniline

Methylene Blue :- Methylene blue has weak antiseptic properties. The action of methylene blue is considered to be bacteriostatic.



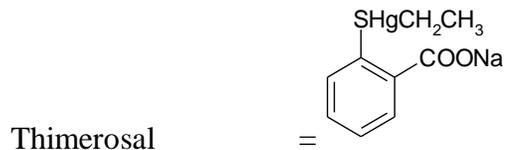
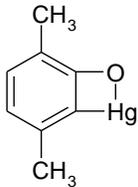
D):- MERCURY COMPOUNDS (MERCURIALS) :-

Exam:- Mercuric chloride =  $\text{HgCl}_2$

Mercurous chloride(Calomel) =  $\text{Hg}_2\text{Cl}_2$

Ammoniated mercury=  $[\text{Hg}(\text{NH}_2)\text{Cl}]$

Nitromersol =



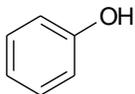
E):- PHENOLS AND THIER DERIVETIVES :-

Phenol coefficient :- Is defined as the ratio of a dilution of a given test disinfectant to the dilution of phenol that is required to kill a stain of salmonella typhi at controlled time and temperature conditions.

Exam:-If the dilution of a test disinfectant is 10-fold greater than the dilution of phenol, the phenol coefficient is 10.

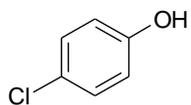
Note- The phenol coefficient of phenol is One.

- Examples- (Carbolic acid)

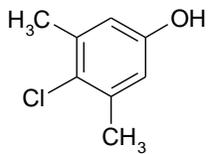


Note- Phenol is almost obsolete as an antiseptic and disinfectant.

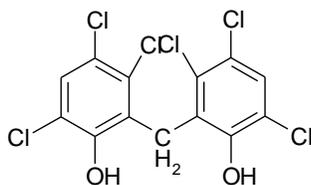
- P- Chlorophenol:-



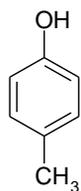
- P- chloro-m-xylene:-



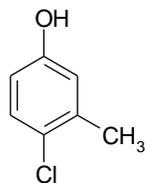
- Hexachlorophene:-



- Cresol:-

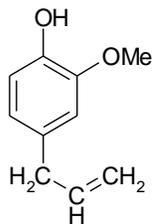


- Chlorocresol:-

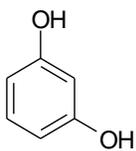


- Thymol :-

- Eugenol :-

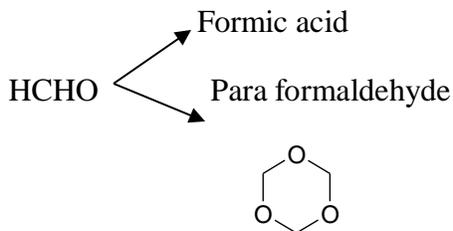


- Resorcinol :-



## F) ALDEHYDES :-

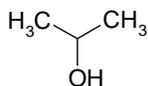
\* Formaldehyde solution :- (Should be kept into closed container)



## G) ALCOHOLS AND RELATED COMPOUNDS :-

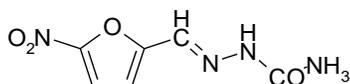
The term alcohol means that substance K/a ethyl alcohol.

- Ethanol -  $C_2H_5OH$
- Isopropyl alcohol -

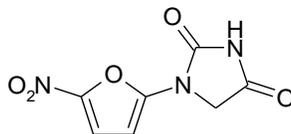


H) NITROFURAZONES :- Picric acid ( trinitrophenol ) had been used earlier as an antiseptic on burned skin.

\* Nitrofurazone :-

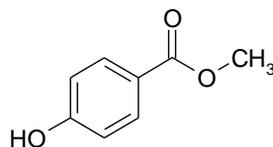


\* Nitrofurantion :-

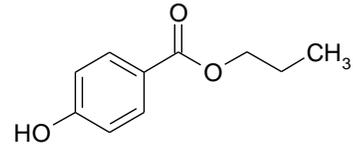


## I) PRESERVATIVES :-

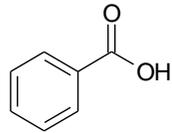
- Parabenes ( Ester of p-hydroxybenzoic acid )
- Methyl paraben



- Propyl paraben



- Benzyl alcohol
- Benzoic acid



- Sodium benzoate