# Appendix H Disinfectants (Advantages and Disadvantages)

**Disinfectant Chart:**

**Disinfectant Class** **Activity Indicated**

| | **Bactericidal** | **Tuberculocidal** | **Pseudomonas *sp.*** | **Sporicidal** | **Virucidal** |
|---|---|---|---|---|---|
| Quaternary Ammon. Cpds. | good | none | fair | none | moderate |
| Phenolic Compounds | good | good | good | poor | moderate |
| Iodine | good | good | good | moderate | good |
| Chlorine Compounds | good | good | good | moderate | good |
| Glutaraldehyde | good | good | good | good | good |
| Formaldehyde | good | good | good | good | good |
| Alcohols | good | good | good | good | moderate |
| Acids/alkalies | good | good | good | good | good |
| Mercurials (not recommended) | fair | none | fair | none | fair |

**QUATERNARY AMMONIUM COMPOUNDS**

**Advantages**

+ good disinfectant action - Gram (+) microbes
+ soluble in water and alcohol
+ generally nontoxic and non-allergenic
+ easily prepared and used
+ EPA registered as a disinfectant
+ possess detergent and surfactant properties
+ almost odorless (pleasant aromatic smell)
+ materials compatible
+ useful for sanitizing applications
+ inexpensive

**Disadvantages**

- decreased activity against Gram (-) microbes
- no sporicidal activity
- poor activity against pseudomonas
- not effective against all nosocomial infections
- substantial interference by organic matter
- reports of contact dermatitis
- lack tuberculocidal properties
- poor activity against hydrophilic viruses
- development of resistant bacterial strains
- incompatible with soaps
- inactivated by stoppers, gauze, cotton, etc.

**PHENOLICS**

**Advantages**

+ wide spectrum of antimicrobial activity
+ many formulations available
+ good sanitizer/germicide for housekeeping
+ phenol coefficient readily attainable
+ readily miscible with additives (e.g. soap)
+ good cleansing action
+ EPA registered as a disinfectant

**Disadvantages**

- relatively poor sporicide
- skin and mucous membrane irritant
- inactivated by organic matter
- relatively expensive
- possesses unpleasant odor
- toxic
- materials incompatible (stains and odors)

**IODOPHORS**

**Advantages**

+ powerful germicidal properties of iodine
+ relatively free of toxicity and irritancy
+ safe and convenient to use
+ stable in storage
+ EPA registered as a disinfectant
+ readily miscible with water
+ almost colorless and nonstaining
+ powerful detergent action
+ generally non-corrosive

**Disadvantages**

- corrosiveness of some surfaces
- relatively expensive
- unstable above 54$^{o}$C
- not considered instrument-safe

## CHLORINE COMPOUNDS

**Advantages**

+ wide spectrum of rapid biocidal properties
+ facility of handling and use
+ insignificant residues
+ acceptable odor
+ deodorizing/sanitizing properties
+ low levels of toxicity and irritancy
+ non-staining and colorless
+ low cost

**Disadvantages**

- sporicidal properties questionable
- possible bronchial irritation from inhalation
- corrosion of metals
- bleaching effect on fabrics
- not registered as disinfectant by EPA
- skin irritation on prolonged contact
- general caustic effects
- product deterioration on standing
- non-wetting action
- possible CO-carcinogenic properties

## GLUTARALDEHYDE

**Advantages**

+ broad spectrum of antimicrobial properties
+ good activity in presence of organic matter
+ low volatility (vapor pressure like water)
+ EPA registered as disinfectant
+ relatively rapid disinfecting action - 10 minutes
+ compatibility with metal, rubber, and plastic materials
+ nonflammable
+ EPA registered as a sporicide

**Disadvantages**

- activation required
- slightly to moderately toxic
- not recommended for carbon steel surfaces
- can cause allergic contact dermatitis
- rinsing required to remove residual disinfectant
- tissue irritation (especially to eyes and mucous membranes)
- definite shelf-life

## FORMALDEHYDE

**Advantages**

+ wide spectrum of biocidal properties
+ can be rapidly neutralized
+ relatively inexpensive
+ stable when properly stored
+ excellent vapor phase disinfectant paraformaldehyde
+ active in the presence of organic matter
+ readily available
+ registered as a disinfectant by EPA

**Disadvantages**

- extremely pungent and suffocating odor
- can cause allergic dermatitis
- skin and mucous membrane irritant

## ALCOHOLS

**Advantages**

+ highly effective bactericides
+ effective virucidal agents
+ pleasant odor
+ non-staining
+ easily obtainable and used
+ non-irritating
+ stable when stored properly
+ effective tuberculocidal agents
+ time to kill - in seconds
+ evaporation without residue formation
+ cleansing activity
+ generally nontoxic
+ inexpensive
+ non-allergenic

**Disadvantages**

- nonsporicidal
- skin and mucous membrane irritation
- volatile flammable
- inventory and procurement problems
- activity against hydrophilic viruses questionable
- organic matter interference
- some incompatibility with rubber and plastic materials
- not registered as a disinfectant by EPA