

Sterilization Methods



Microbiology
Biology II
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Terminology

- Sterilization – complete elimination of microbial viability
- Sterilant – chemical agent that sterilizes
- Disinfection – killing, inhibition or removal of disease-causing microbes.
- Disinfectant – chemical agent that disinfects
- Antiseptic – chemical agents applied to tissues which prevent sepsis
- Sanitation – establishment of environmental conditions favorable to health.

Terminology

- -cide: to kill
 - Germacide
 - Bactericide
 - Fungicide
- -static: to inhibit growth
 - Bacteriostatic
 - Fungistatic

Oxygen Requirements for Microbes



- Obligate aerobes – grow only in the presence of oxygen.
- Strict anaerobes – grow only in the absence of oxygen.
- Facultative anaerobe – can grow in presence (best) or absence of oxygen.
- Microaerophilic – require small amount of oxygen (about 5%), inhibited by normal (oxygen) of atmosphere.
- Aerotolerant – oxygen?? Who cares!!!!

Oxygen Requirements For Microbes



Chemical Agents



- Work by disrupting cellular membranes, oxidizing macromolecules, denaturing proteins.
- Include disinfectants and antiseptics
- Classified base upon effectiveness:
 - High Level – effective against all life
 - Intermediate Level – defined as tuberculocidal, as well as more resistant viruses (hepatitis C virus)
 - Low Level – kill vegetative cells of bacteria and fungi and enveloped viruses.

Chemical Agents

- Phenolics – contain phenol or its derivatives
 - Disinfectant; intermediate to low level
- Aldehydes
 - Formaldehyde
 - Disinfectant: high to intermediate level
- Alcohols
 - Antiseptics and disinfectants; intermediate level

Chemical Agents

- Halogens
 - Disinfectant and antiseptic; intermediate level
- Heavy Metals
 - Disinfectant and antiseptic; low level
- Soaps
 - Detergents derived from lipids
 - Antiseptic and disinfectants; low level
- Gases
 - Disinfectant; high level

What Can Be Used In Our Lab?????

- Soap
- Disinfectant
- Antiseptic
- Sterile filtration
- Bunsen Burner