

Microbiology Laboratory

Lab 5: Disinfection

Disinfection is the process of reduce or inhibit the growth of bacteria and other pathogens that may cause infectious diseases in humans and animals on surfaces or objects to a level that is considered safe for public health. Unlike sterilization, disinfection does not eliminate all microorganisms, but it significantly reduces their numbers, making the environment or item safe for use. **Disinfection is commonly used for non-living surfaces and equipment in pharmaceutical facilities, laboratories, and manufacturing areas.** It is also used in cleaning pharmaceutical production equipment between batches to prevent cross-contamination. The process of disinfecting removes harmful organisms from objects. This is usually done by applying chemical sprays or wipes.

One of the greatest advantages to disinfecting is the availability of products to the general public. It's possible to find disinfectants in wipe, spray, or other liquid forms, and you can even make your own products at home. Depending on the type of disinfectant used, the product may need to be left on surfaces for as little as 20 minutes or as long as 12 hours.

Methods of disinfection in the pharmaceutical industry include:

- **Chemical disinfectants:** Such as alcohol, hydrogen peroxide, quaternary ammonium compounds, and chlorine compounds.
- **Ultraviolet (UV) radiation:** Used to disinfect surfaces and air in certain environments.
- **Dry heat or moist heat treatment:** Can also be used for disinfection at lower temperatures compared to sterilization.

Disinfecting and sterilizing are both types of decontamination, a process that makes something safe to touch. The purpose is to kill enough germs so the risk of infection is extremely low. Decontamination is different from cleaning, which can get rid of dust and dirt but may only remove some of the germs that are present.

In summary, sterilization aims to completely eliminate all microorganisms, while disinfection reduces their numbers to safe levels but does not achieve a sterile state. Both processes are essential in the pharmaceutical industry to maintain product safety and protect public health. The choice of method depends on the specific requirements of the pharmaceutical product, equipment, or environment being treated.

What it kills: Disinfectants can kill most viruses and fungi, with the majority of commercial products also marketed as effective against the COVID-19 virus when used as directed. While disinfectants can kill bacteria, they may not be able to treat bacterial *spores*, which lay dormant.



Similarities Between Disinfection and Sterilization

Disinfection and sterilization have a few things in common. These include:

- Both are used to decontaminate objects and surfaces
- Both processes can kill (most) harmful microbes.

The important difference between disinfection and sterilization:

Disinfection	Sterilization
In this, the number of harmful microbes is minimized to a negligible level.	In this, the medium is made completely free from all microbes.
It kills only vegetative cells and not the spores.	It kills both vegetative cells and spores.
Wounds are disinfected – with agents such as hydrogen peroxide or rubbing alcohol.	Wounds cannot be sterilized – as it may kill surrounding healthy cells.
Disinfection only reduces the effect of microbes.	Sterilization completely rids microbes from the surface
Chemical methods are used for disinfection	Combination of heat, irradiation, high pressure, chemical and physical methods are used for sterilization
Phenol, alcohol, chlorine, iodine is some of the disinfecting agents.	High temperatures, steam, radiation, filtration is some of the sterilization techniques.
Only adequate cleanliness	Extreme cleanliness
Used in daily life.	Used primarily for medical and research purposes.
For ex., pasteurization, disinfecting urinals, etc.	For ex., sterilization of instruments used during surgery by autoclaving.