

Disinfectants for the Classroom

There are many disinfectants available. The difficulty is that there is no perfect disinfectant: effective, safe, readily available and inexpensive. The table below highlights the types available and their advantages and disadvantages. Since there are no pathogens used in the classroom, most of the disinfectants described in the table should be fine; however, pine oil products should be avoided since they are ineffective in killing bacteria.

Recommendations

- To disinfect bacterial cultures, plates, swabs, pipettes, toothpicks and other contaminated materials soak them in 5-10% household bleach – leave overnight and then discard.
- To disinfect surfaces, wipe thoroughly with 1:100 dilution of household bleach or 1:200 dilution of Lysol.
- While bleach can be used by students to clean lab benches, it is better for students to use a disinfectant that will not ruin their clothing such as a phenol (Lysol) or chlorhexidine (PhisoHex).
- Keep disinfectant hand cleaner by the sink for use by students to clean their hands.

TYPE	BRAND NAMES	ACTION SPECTRUM	ADVANTAGES	DISADVANTAGES
Chlorine	Clorox, Purex (5.25% sodium hypochlorite)	Effective against bacteria and viruses. Generally used at a 1:30 dilution of ordinary household bleach (one ounce per quart of water). Needs 5 min contact time. Rapidly inactivated by organic materials.	Good disinfectant and deodorizer. Inexpensive and available.	Caustic, rapidly inactivated by organic material, loses effectiveness quickly, produces carcinogenic by-products, ruins clothing.
Stabilized chlorine dioxide	Oxyfresh Dent-	Effective against bacteria and viruses. Rapidly inactivated by organic materials.	Good disinfectant and deodorizer. Diluted solution is safe.	Not readily available. Expensive. Rapidly inactivated by organic material. Concentrated chlorine dioxide fumes may be toxic to living tissue.
Phenols	Lysol (phenol*, <u>not</u> benzyl ammonium Cl), Stericol, O-Syl Staphene, 1-Stroke Environ,	Effective against many bacteria, fungi and some viruses. Requires 10 min. contact time. May not work well in the presence of organic material.	Good bacterial and viral disinfectant. Moderate cost.	High concentrations can irritate skin eyes and lungs. Does not kill all bacteria and viruses. May not work well in the presence of organic material
Chlorhexidine gluconates	Nolvasan, PhisoHex, ViroSan, Hibitane,	Effective against most bacteria and some yeast. Requires 10 min. contact time. Does not kill bacterial spores or viruses.	Effective against bacteria; non-toxic. Moderate-high cost.	Not effective against <i>Pseudomonas</i> . Does not kill spores or viruses.
Quaternary ammonium compounds	Roccal-D, Quintacide, Parvosol, Hitor, Merquat, Cetylacide	Cleaner and disinfectant. Effective against many types of bacteria, some viruses, but not against spores or fungi. Requires contact time of 10 min.	Effective against most bacteria. Detergent helps to remove organic material. Low toxicity.	Expensive to purchase initially, although it is used in dilute solution (0.1% final). Does not kill spores, fungi. <i>Pseudomonas</i> , or some viruses.
Glutaraldehydes	Wavecide, Cidex, Sporicide, Banacide, Sterol	Effective against bacteria, including spores, and viruses. Works well in presence of organic material and is very stable compared to other disinfectants.	Very stable and effective.	Expensive. Difficult to obtain. Can irritate skin, eyes and lungs.
Alcohols		Ethanol is effective against a wide variety of pathogens if soaked for sufficient time (20-30 min). 70% ethanol is considered most effective disinfectant.	Broad range, low cost, readily available, non-toxic	Requires long contact time and evaporates quickly so items must be soaked in alcohol. Flammable.
Iodines	Vanodine, Betadyne, Povidone, Scrubodyne	Effective against most bacteria, including spores, and some viruses. Requires 30 min. contact time. Rapidly inactivated by organic materials.	Good disinfectant. Readily available. Long shelf life. Moderate cost.	Rapidly inactivated by organic materials. Must be used in concentrated form, which stains surfaces.
Pine oil	Pine-Sol, Hexol	Pine oils have some disinfectant properties, but they are not very effective.	Good for cleaning, low cost, non-toxic, readily available.	Not effective in killing pathogens.

* Note that many Lysol™ products in the grocery store do not contain phenol. The effective form is the hospital strength Lysol that contains phenylphenol.

Contributed by:

Teresa Thiel
Department of Biology
University of Missouri-St. Louis

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