

Properties of Commonly-used Laboratory Disinfectants for Surface Cleaning

Class of Disinfectants and Examples	How they Work	Advantages	Disadvantages	Hazards
<p>Alcohols</p> <p>Examples: Ethyl alcohol</p> <p>Isopropyl alcohol</p>	<ul style="list-style-type: none"> • Damage cell membranes, denaturing essential microbial proteins and interfering with metabolism and resulting in cell lysis. • Mixtures of alcohols and water are more microbicidally active than absolute alcohol; however, activity drops sharply if alcohol content falls below 50% 	<ul style="list-style-type: none"> • Do not leave residues • Inexpensive 	<ul style="list-style-type: none"> • Effectiveness against non-lipid containing viruses is variable • Requires significant contact time to be effective • Evaporates before required contact time • Ineffective against spores • May harden rubber • Can dissolve some glues 	<p>Flammable</p>
<p>Chlorine Compounds</p> <p>Household Bleach</p>	<ul style="list-style-type: none"> • Free available chlorine reacts with contents within microorganism, reaction byproducts cause its death • Stability of free available chlorine is dependent upon chlorine concentration, pH of organic matter and light. 	<p>Inexpensive</p> <p>Effective against lipid and non-lipid viruses</p> <p>Wide bactericidal spectrum</p>	<ul style="list-style-type: none"> • Solutions must be made fresh regularly to maintain free available chlorine at levels that deactivate organisms • Corrodes metals • Organics may reduce activity • Increase in alkalinity decreases bactericidal property • Unpleasant odor • Needs extended contact time to be considered tuberculocidal 	<p>Care must be taken not to inadvertently mix chlorine bleach with other disinfectants, due to potential to generate chlorine gas.</p> <p>Never autoclave chlorine bleach.</p>

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Quaternary Ammonium Compounds	Affects proteins and cell membrane of microorganism	Primarily effective against gram positive bacteria; Good for water baths, incubators where halide or phenolic residues are not desired.	Does not eliminate spores May not be effective against non-lipid viruses	If used according to manufacturer's directions, considered non-toxic.
Phenolics Wescodyne		Active against vegetative bacteria and lipid-containing viruses	<ul style="list-style-type: none"> • Not effective against spores • Variable activity against non-lipid containing viruses • Unpleasant odor • Some areas have disposal restrictions • Effectiveness reduced by alkaline pH, natural soap or organic material • Not considered sporicidal 	May be absorbed by latex gloves Can penetrate the skin Irritant
Iodophors Vesphene	Quickly penetrates cell wall of microorganism; disrupts protein and nucleic acid structure and synthesis	<ul style="list-style-type: none"> • Kills broad range of organisms • Kills immediately rather than by prolonged period of stasis • Not affected by hard water 	<ul style="list-style-type: none"> • Stains plastics and can corrode metal • iodophors designed to be used as skin antiseptics (such as povidone-iodine) should not be used for disinfection of surfaces • not considered to be effective against spores 	<ul style="list-style-type: none"> • Skin and eye irritant • Corrosive • Toxic
Accelerated Hydrogen	Hydrogen peroxide generates free hydroxyl radicals, which	Stable in storage Effective against a broad	Check product label to determine contact times required for product to	

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Peroxide Accel Wipes	attack membrane lipids, essential cell components and causes DNA strand breakage in growing bacteria	spectrum of microbes	be considered tuberculocidal and virucidal.	
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References:

Russell, Hugo & Ayliffe's Principles and Practice of Disinfection , Preservation and Sterilization, 5th ed. (ed. A.P. Fraise, J. Maillard, S.A .Satter, John Wiley & Sons, New York, pp. 5-70.