Characteristics of Selected Disinfectants[1]

CCQA CALF CARE & QUALITY ASSURANCE

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DISINFECTANT CATEGORY	Alcohols	Alkalis	Aldehydes
Common Active Ingredients	ethanol, isopropano	calcium hydroxide, sodium carbonate, calcium oxide	formaldehyde, glutaraldehyde, ortho-phthalaldehyde
Sample Trade Names*			*Synergize®*
Mechanism of Action	precipitates proteins; denatures lipids	alters pH through hydroxyl ions; fat saponification	denatures proteins; alkylates nucleic acids
Characteristics	• fast acting • rapid evaporation • leaves no residue • can swell or harden rubber and plastics	• slow acting • affected by pH • best at high temperatures • corrosive to metals • environmental hazard • severe skin burns; mucous membrane irritation	• slow acting • affected by pH and temperature • irritation of skin/mucous membrane • only use in well ventilated areas • pungent odor • noncorrosive
Precautions	flammable	very caustic	carcinogenic
Bactericidal	+	+	+
Virucidal	±[a]	+	±
Fungicidal	+	+	+
Tuberculocidal	+	±	+
Sporicidal	-	+	+
Factors Affecting Effectiveness	inactivated by organic matter	variable	inactivated by organic matter, hard water, soaps, and detergents

Oxidizing Agents			Phenols	Quaternary Ammonium Compounds
Halogens: Chlorine	**Halogens: Iodine**	**Peroxygen Compounds**		
sodium hypochlorite (bleach), calcium hypochlorite, chlorine dioxide	povidone-iodine	hydrogen peroxide/accelerated HP, peracetic acid, potassium peroxymonosulfate	ortho-phenylphenol, orthobenzylpara-chlorophenol	benzalkonium chloride, alkyldimethyl ammonium chloride
Clorox®, Wysiwash®		*Rescue®, Oxy-Sept 333®, Virkon-S®*	*One-Stroke Environ®, Pheno-Tek II®, Tek-Trol®, Lysol®*	*Roccal-D®, DiQuat®, D-256®*
denatures proteins	denatures proteins	denature proteins and lipids	denatures proteins; disrupts cell wall	denatures proteins; binds phospholipids of cell membrane
• fast acting • affected by pH • frequent application • inactivated by UV radiation • corrodes metals, rubber, and fabrics • mucous membrane irritation	• stable in storage • affected by pH • requires frequent application • corrosive • stains clothes and treated surfaces	• fast acting • may damage some metals (e.g., lead, copper, brass, zinc) • powdered form may cause mucous membrane irritation • low toxicity at lower concentrations • environmentally friendly	• can leave residual film on surfaces • can damage rubber, plastic; non-corrosive • stable in storage • irritation to skin and eyes	• stable in storage • best at neutral or alkaline pH • effective at high temps • high concentrations corrosive to metals • irritation to skin, eyes, and respiratory tract
toxic gas released if mixed with strong acids or ammonia			May be toxic to animals, especially cats and pigs	
+	+	+	+	+
+	+	+	+	+ enveloped
+	+	±	+	+
+	+	±	+	-
+	±	+	-	+
rapidly inactivated by organic matter	rapidly inactivated by organic matter	effective in presence of organic matter, hard water, soaps, and detergents	effective in presence of organic matter, hard water, soaps,and detergents	inactivated by organic matter, hard water, soaps, and anionic detergents

+ = effective **±** = variable or limited activity **-** = not effective [a] = slow acting against nonenveloped viruses (e.g., norovirus)

[1] *Adapted with permission from: Characteristics of Selected Disinfectants, Center for Food Security and Public Health, Iowa State University, College of Veterinary Medicine, available at: http://www.cfsph.iastate.edu/Disinfection/Assets/CharacteristicsSelectedDisinfectants.pdf*