UCR Environmental Health & Safety

Spotlight On Safety

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SELECTING CHEMICAL DISINFECTANTS

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The proper selection and use of disinfectants is essential for safety and quality control. The disinfectant table below lists the disinfectants most commonly used in laboratories. If necessary, actual testing should be done to determine the most effective disinfectant and use parameters. The application of the indicated concentrations and contact times of the disinfectants have not been assumed to result in a sterile state. All EPA registered antimicrobials must be used according to California worker safety regulations, including commonly used disinfectants such as Clorox bleach or Roccal.

Disinfectant Table

Disinfectant	Amount	Purpose
Alcohols	70%	General use disinfectant: fast acting, leaves no residue, and compatible if combined with other disinfectants (quaternaries, phenolics, and iodine) to form tinctures. **Flammable, not to be used near a flame.**
Aldehydes	1. 8% 2. 8% in 70% alcohol 3. 2% solutions	Effective against wide spectrum of bacteria and viruses. Sporicidal when used properly (10 hour contact period) 1. Formaldehyde Solutions 2. Formaldehyde-Alcohol Solutions 3. Activated Glutaraldehyde Limited and controlled use because of its toxic properties and potential damage to eyes, must only be used in ventilated hood, and limited stability after activation (for alkaline glutaraldehyde).
Chlorine Compounds	1:10 dilution; 1:5 dilution (250 ppm) for bacterial spores and mycobacteria	Disinfectant for cleanup of blood or body fluids spills. Biocidal effect on *M. tuberculosis*, *S. aureus*, other vegetative bacteria, and HIV after 10-20 minutes, Decay rate of diluted chlorine bleach stored at room temperature in a closed plastic container will deteriorate by half after 1 month, neutralizes rapidly in the presence of organic matter, good for decontamination of HBV, HCV, HIV, and cleanup of biohazardous spills. **Undiluted bleach for surface disinfecting after possible contamination with the CJD virus; however, NIH is recommending 1.0 N NaOH**
Iodophor	100 ppm available in iodine	Poor activity against bacterial spores, rapid biocidal action, effective against Gram-negative and Gram-positive organisms, some viruses, and tubercle bacilli. Most effective in acid solutions, vaporize at 120°F to 125°F (should not be used in hot water). Effectiveness reduced by organic matter, stable in storage if kept cool and tightly covered. Built-in indicator is still active if solution is brown or yellow and may tarnish silver, silver plate, and copper.
Mercurials		Poor activity against vegetative bacteria and are not effective on spores. Toxic and not recommended.

Disinfectant	Amount	Purpose
Phenolic compounds	500 ppm active agent	Effective against vegetative bacteria, fungi and lipid-containing viruses. Low solubility in water, stable in storage. Germicidal against Gram-negative/ positive organisms and tubercle bacilli. Effective over large pH range, but has limited sporicidal activity. Prolonged contact deteriorates rubber, can cause skin and eye irritation. **Not for use on food contact surfaces. Drain disposal prohibited.**
Quaternary ammonium compounds	400 ppm active agent	Acceptable to control vegetative bacteria and non-lipid-containing viruses. Stable in storage. No odor, but act as deodorizers; non-irritating to skin, but avoid skin or eye contact. Effective at temperatures up to 212°F, effective against Gram-positive organisms, bacteriostatic in high dilutions. Ineffective against tubercle bacilli, spores and viruses. More effective in alkaline than acid solutions, neutralized by soap, and effectiveness reduced by organic material.