Guidelines for the Use of Bleach as a Disinfectant

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Office of the Chief Risk Officer

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Bleach is utilized as a component of the cleaning and disinfection for laboratories, with the effective chemical compound known as sodium hypochlorite (NaClO). Bleach is widely used as disinfectant for its ability to kill bacteria, viruses (especially non-enveloped viruses) and fungal hyphae. This document provides the guidelines to ensure effectiveness of bleach when it is used as disinfectant.

Concentration & Contact Time

1. If the household bleach is 5.25 to 6.15% sodium hypochlorite, a 1:10 (v/v) dilution of household bleach with water (**0.5 to 0.6% sodium hypochlorite**) yielding 5250 to 6150 ppm available chlorine can be utilized for liquid biological waste decontamination or dealing with biohazardous spillage.

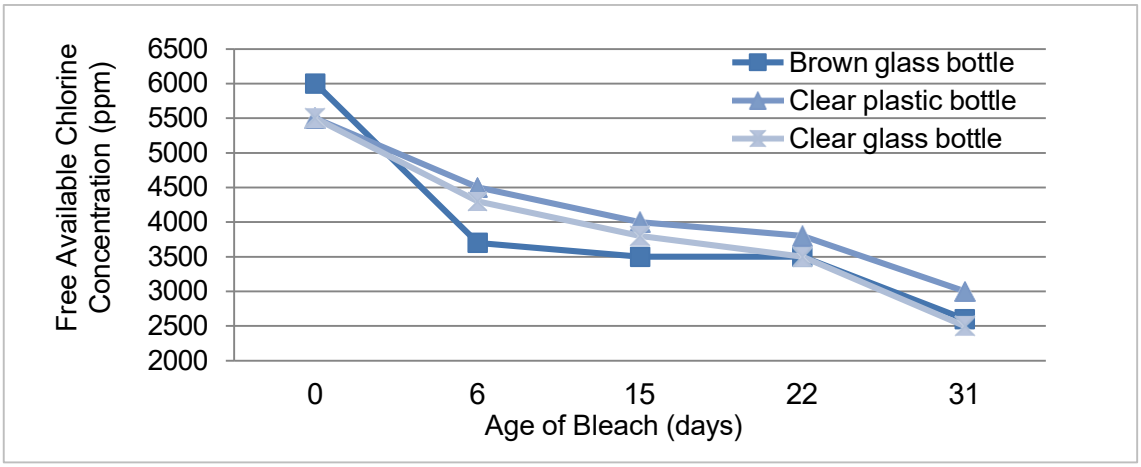
Note: industrial solutions of bleach have a high sodium hypochlorite concertation (~10%), must be diluted accordingly to obtain the levels indicated above.

2. Bleach solution requires **at least 10 min of contact time** to allow complete disinfection.

Stability & Storage

To ensure the effectiveness of decontamination, the diluted bleach solution must be stored in opaque containers with **a maximum storage time of 24 hours**. Otherwise, the available chlorine concertation in the bleach will degrade rapidly in the presence of light as shown in the table below:

Table 1. Effect of storage time on free available chlorine concentration in diluted household bleach stored in different containers.



Liquid Aspiration System

When cell/bacteria culture work is conducted, a liquid aspiration system is usually utilized to collect the liquid waste (i.e. culture medium). In the system, 10% volume of bleach is prepared in the waste collection flasks, and liquid waste is pumped into the first flask to be decontaminated (Figure 1). To use the aspiration system for liquid waste decontamination, one must make sure:

- ✓ Use a secondary flask to avoid overflowing.

- ✓ An in-line HEPA filter must be use to prevent the vacuum system from being contaminated.
- ✓ Place the flasks inside a spill tray in case of a spill.
- ✓ Label the flasks with preparation date to ensure the effectiveness of bleach.

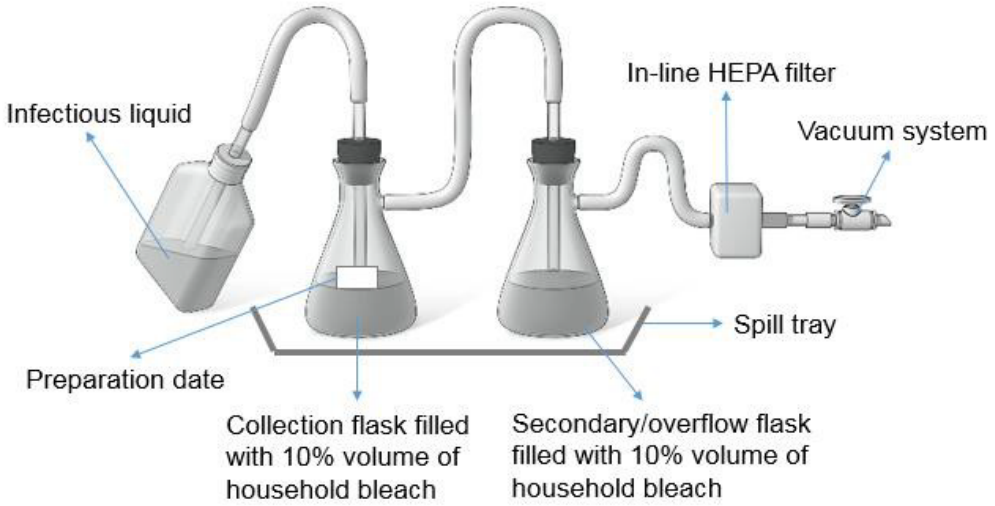


Figure 1. Liquid aspiration system utilized for biomedical liquid waste decontamination.

Liquid Waste Final Disposal

To minimize and eliminate the environmental pollution, liquid waste generated from research activity is **NOT** allowed to put down in drain. Once the biomedical liquid waste is decontaminated by bleach, it must be collected in a carboy liquid waste container (DO NOT MIX LIQUID WASTE CONTAINING BLEACHING WATER WITH OTHER LIQUID WASTE!) and picked up from the labs for external disposal.

Health & Safety

- ✓ Personal protective equipment (PPE) including gloves, safety glasses and lab coat must be worn when preparing and using the bleach solution. Prepare the solution in a fume hood.
- ✓ If bleach spills in eye or on skin, flush the area with running water immediately. Keep flushing your eye for 15 min. For any emergency, call ext. 5411 and report to OCRO: bio.safety@uottawa.ca.

Reference

1. Healthcare Infection Control Practices Advisory Committee (HICPAC). Guideline for Disinfection and Sterilization in Healthcare Facilities.
2. World Health Organization (WHO). Laboratory Biosafety Manual: 4th edition. Decontamination and waste management.