

## Disinfection protocol using household bleach

1. Wear lab coat, eye protection, and gloves.
2. The bleach concentration depends on the use. For **plastic boxes**, make a fresh dilution of household bleach (5.25% hypochlorite) in **cold** water at a 1:20 ratio (1 part bleach plus 19 parts water, yielding 2625 ppm hypochlorite). If you are killing **used media**, pour in the bleach to a final concentration of 10%. The higher concentration is used since the active chlorine molecules will readily react with organics to form the less efficacious organic chloramines (cover the container to reduce the "stink").

**Never** mix bleach with acid (present in many cleaning products), as it will give off deadly chlorine gas.

Why a fresh dilution? Diluted bleach is unstable, particularly when exposed to light (Fig. 1). Note that the decay rate depends on temperature, light intensity, light wavelength, pH, and chemicals in the water. Do not assume that storage for longer than two days is acceptable. In sunlight in distilled water, the half-life is 5 days at 25C; the half-life in the dark is 45 days. However, in practice the half-life may be much lower. The levels of heavy metals found in normal water can decrease the half-life by 10-fold, for example.

3. Soak the items for 30 min. Put up a **sign** warning people that bleach is present.

Why 30 min? Even at 20 ppm hypochlorite, fungal spores are killed in less than 5 min. Going for 30 min provides a "safety factor". For example, if the water is slightly alkaline, the bleach will be less effective (Fig. 3). There is no reason to go longer than 30 minutes.

Bleach and metals. Bleach will eat through metal, even stainless steel. With stainless steel, the bleach will remove the chromium oxide outer layer, leading to normal galvanic corrosion. Therefore, **never** soak metal items for longer than 30 minutes, and rinse with water afterward.

Bleach and plastic. Polystyrene is not damaged by 1:10 or greater dilutions of household bleach.

4. When done, wash the bleach down the sink and rinse with water.

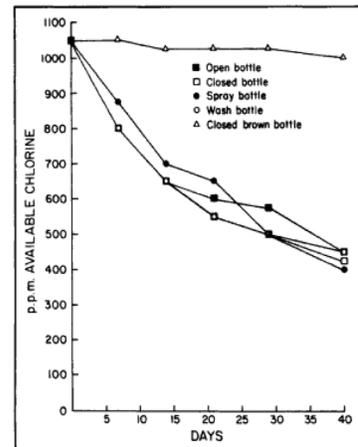


Figure 3. Effect of container type on decomposition of 1:50 dilution of 5.25% sodium hypochlorite.

Fig. 1, *Inf Cont Hosp Epidemiol* 19:323, 1998

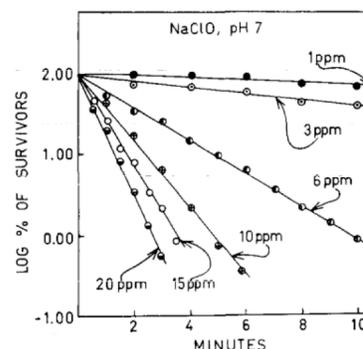


Fig. 10—Destruction of *A. niger* conidiospores by various concentrations of NaClO at pH 7.0.

Fig. 2, *J Food Sci* 35: 62, 1970.

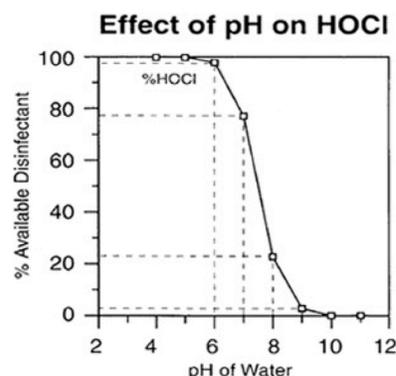


Fig. 3. Note that straight bleach is pH 12.6; it is relatively ineffective until diluted in water, which lowers the pH!