Ozone disinfection Comparison of disinfectants

**Comparison between ozone and other disinfectants**

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| [Ozone](http://www.lenntech.com/faqozone.htm) is a very powerful disinfectant. Table 1 compares **Ct-values (concentration \* time**) of various [disinfectants](http://www.lenntech.com/water-disinfection/disinfectants.htm) for the deactivation of viruses. Although [chlorine](http://www.lenntech.com/water-disinfection/disinfectants-chlorine.htm) is very suitable for the deactivation of bacteria and viruses, it cannot be used to deactivate protozoa. Table 2 shows the disinfection rate for the Giardia cyst. In this table, you can see that chlorine and [chloramines](http://www.lenntech.com/water-disinfection/disinfectants-chloramines.htm) have lower Ct-values. This means that ozone is a more powerful disinfectant to deactivate this microorganism. The protozoa Cryptosporidium is hardly deactivated by chlorine and chloramines [30,31]. The Ct-value for deactivation by chlorine varies between 3000 and 4000 mg min/L for 1-log deactivation (= 90% deactivation). Both tables are derived from the Environmental Protection Agency (EPA) [30].  ***Table 1: Ct-values for the deactivation of viruses by various disinfectants***  http://www.lenntech.com/images/ozon_ctwaarde_virus.gif  ***Table 2: Ct-values for the deactivation of Giardia cysts by various disinfectants***  http://www.lenntech.com/images/ozon_ctwaarde_giardia.gif  The benefit of [ozone](http://www.lenntech.com/otozone.htm) is that it influences pH and temperature minimally on a broad spectrum. Although ozone solubility decreases when temperatures rise, disinfection rates increase per 10°C (factor 2 or 3). Within the range of 0 – 30°C, these two factors diminish one another [6]. The disinfection rate of ozone hardly changes in a pH range of 6 – 8,5 [19]. For certain resistant microorganisms (such as Giardia Muris), the disinfection rate increases at higher pH values [30,34]. For other species of microorganisms, this is the other way around.  Other benefits of ozone application are: - No remaining tastes or odors after treatment - Disinfection byproduct formation is minimal (mainly when [bromine](http://www.lenntech.com/Periodic-chart-elements/Br-en.htm) is absent) - Ozone can remove [disinfection byproduct](http://www.lenntech.com/water-disinfection/disinfection-byproducts.htm) precursors (substances that introduce disinfection byproduct formation) |