Disinfectants and Disinfectant By-Products

Table 1: Summary of C.t values (mg/L. min) for 99% inactivation at 5° C (Clark et al, 1993)

Organism	Disinfectant			
	Free chlorine, pH 6 to 7	Pre-formed chloramine, pH 8 to 9	Chlorine dioxide, pH 6 to 7	Ozone pH 6 to 7
E. *coli*	0.034-0.05	95-180	0.4-0.75	0.02
Polio virus 1	1.1-2.5	768-3740	0.2-6.7	0.1-0.2
Rotavirus	0.01-0.05	3806-6476	0.2-2.1	0.006-0.06
Bacteriophage f_2	0.08-0.18	-	-	-
G. *lamblia* cysts	47->150	-	-	0.5-0.6
G. *muris* cysts	30-630	-	7.2-18.5	1.8-2.0[a]
C. *parvum*	7200[b]	7200[c]	78[b]	5-10[c]

a Values for 99.9% inactivation at pH 6-9.
b 99% inactivation at pH 7 and 25□C.
c 90% inactivation at pH 7 and 25□C.

Ozone and its By-products

- Most efficient disinfectant for all types of micro-organisims
- Decomposes rapidly following application thus no GV has been proposed for ozone
- By-products include:
  - » formaldehyde
  - » aldehydes
  - » hydrogen peroxide
  - » bromomethanes
- Disdavantges include:
  - » lack of residual
  - » biological regrowth in distribution systems
  - » high cost
  - » limited information on toxicity of its by-products