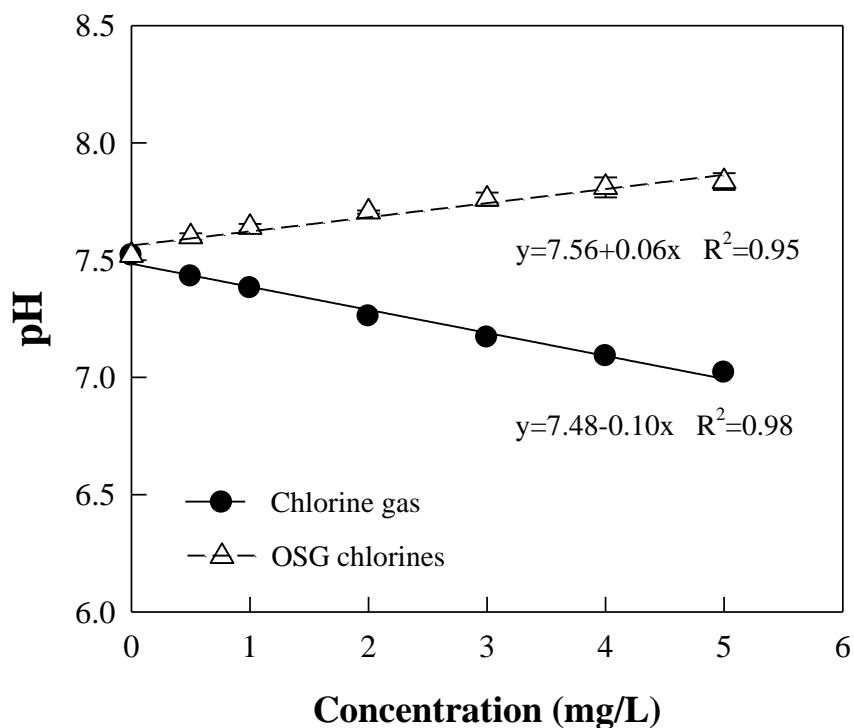
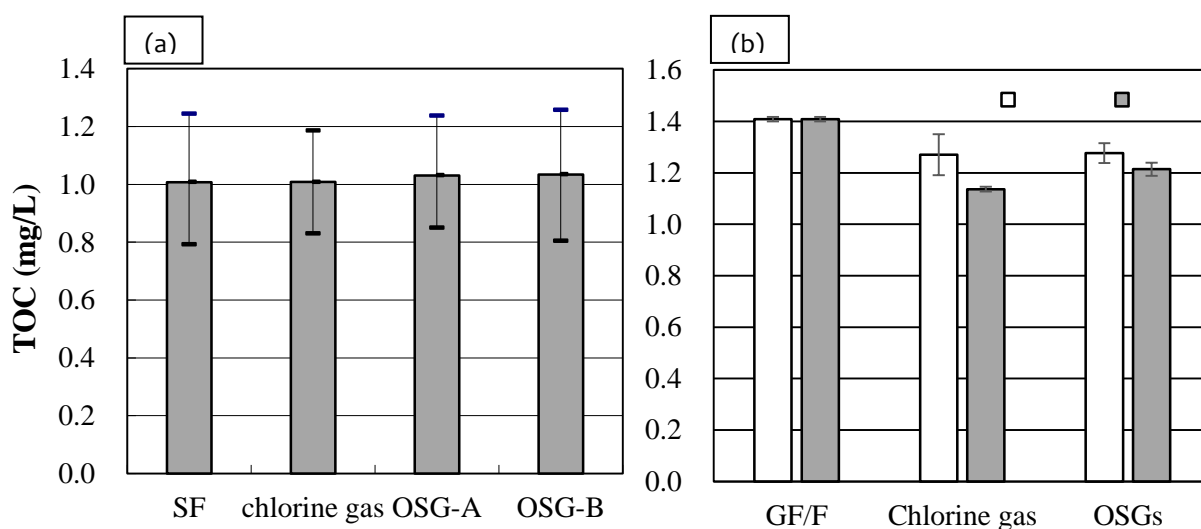


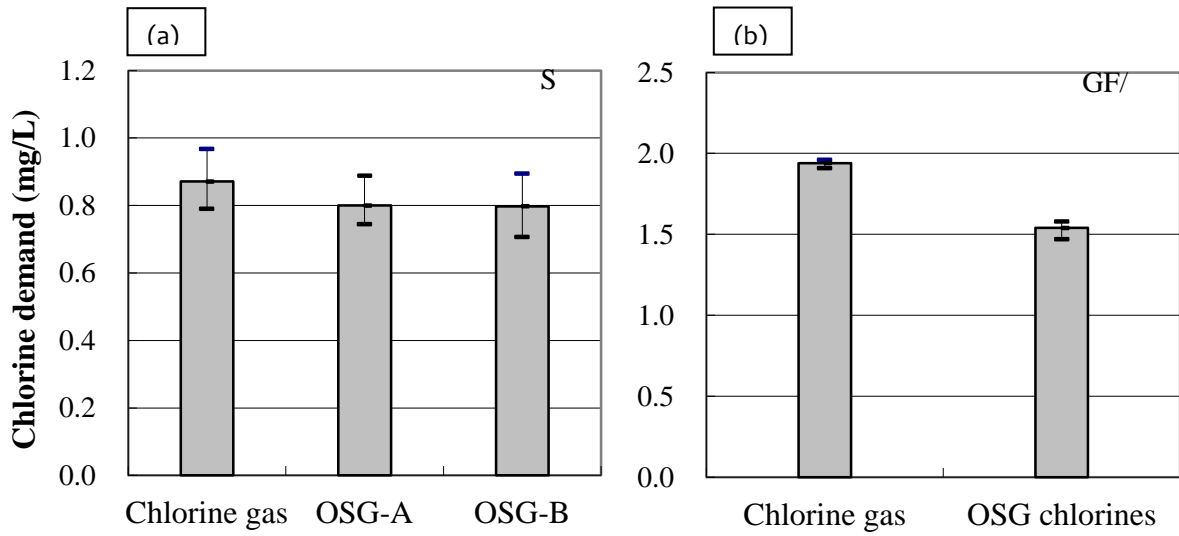
## Supplementary Materials



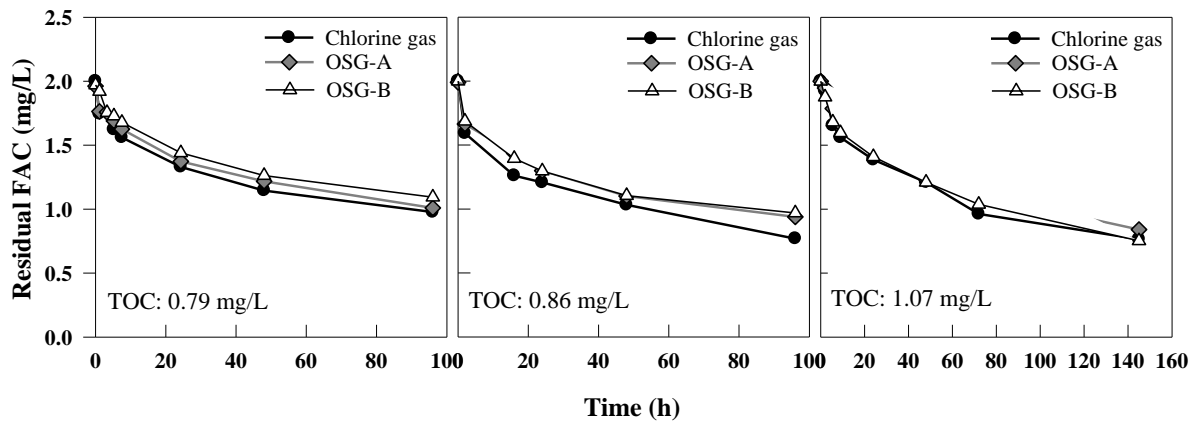
**Fig. S1.** Variations of pH with chlorine gas and OSG chlorine treatment.



**Fig. S2.** The change of TOC concentration by chlorine gas and OSG chlorines in the sand-filtered water (two small-scale OSGs; left) and processed glass fiber-filtered water (five full-scale OSGs; right). The error bars indicate the maximum and minimum level of three test results (a) and the standard deviation of five OSG chlorines (b).



**Fig. S3.** 48 h-chlorine demand with chlorine gas and OSG chlorines in the sand-filtered water (two small-scale OSGs; (a)) and the processed glass fiber-filtered water (five full-scale OSGs; (b)). The error bars indicate the maximum and minimum level of three tests (a) and five OSG chlorines (b).



**Fig. S4.** Variations of residual FAC of chlorine gas and two small-scale OSG chlorines with time.

**Table S1.** Summary of Previous Studies on the Comparison of Chlorine and OSG Chlorine

<b>Parameter</b>	<b>Oxidants/OSG system</b>	<b>pH</b>	<b>Temp (°C)</b>	<b>Results</b>	<b>References</b>
<i>Cryptosporidium parvum</i> Oocysts	Mixed oxidants (bench-scale) Sodium hypochlorite solution (5.25%)	7	25	Higher inactivation by Mixed oxidants	Venczel et al., 1997
	Mixed oxidants (bench-scale) Sodium hypochlorite solution	7	5	Higher inactivation by Mixed oxidants	Sobsey et al., 2000
<i>Bacillus subtilis</i> spore	Mixed oxidants (bench-scale) Sodium hypochlorite solution (5%)	5.7, 7.1, 8.2	4, 20	Higher inactivation by Mixed oxidants at pH 8.2	Son et al., 2004
	Mixed oxidants Sodium hypochlorite solution (10%)	5.6, 8.3	-	Higher inactivation by Mixed oxidants at pH 8.3	Lee et al., 2005
<i>Clostridium perfringens</i> spore	Mixed oxidants (bench-scale) Sodium hypochlorite solution (5.25%)	7	25	Higher inactivation by Mixed oxidants	Venczel et al., 1997
<i>E. coli</i>	Mixed oxidants (bench-scale) Sodium hypochlorite solution (5%)	5.7, 7.1, 8.2	4, 20	Higher inactivation by Mixed oxidants at pH 8.2	Son et al., 2004
Coliphage MS2 Hepatitis A virus (HAV)	Mixed oxidants (bench-scale) Sodium hypochlorite solution	7	5	> 4 log inactivation within 10 min by both oxidants	Sobsey et al., 2000
THMs, HAAs (Field test)	Mixed oxidants Conventional chlorination	-	-	30~50% reduction after replacing chlorine with mixed oxidants	Hamm, 2002
THMs	Mixed oxidants Sodium hypochlorite solution (10%)	-	25	No significant difference between both oxidants	Lee et al., 2005