

## Toxicity Identification and Evaluation for the Effluent from Seawater Desalination Facility in Korea Using *D. magna* and *V. fischeri*

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**Abstract :** In recent years, the interests on the impacts of industrial wastewater on aquatic ecosystem have increased with concern about ecosystem protection and human health. Whole effluent toxicity tests are used to monitor toxicity by unknown toxic chemicals as well as conventional pollutants from industrial effluent discharges. This study describes the application of TIE (toxicity identification evaluation) procedures to an acutely toxic effluent from a Seawater desalination facility in industrial complex which was toxic to *Daphnia magna*. In TIE phase I (characterization step), the toxic effects by heavy metals, organic compounds, oxidants, volatile organic compounds, suspended solids and ammonia were screened and revealed that the source of toxicity is far from these toxicants group. Chemical analysis (TIE phase II) on TDS showed that the concentration of chloride ion (24,215 ~ 29,562 mg/L) was substantially higher than that predicted from EC50 for *D. magna*. In confirmation step (TIE phase III), chloride ion was demonstrated to be main toxicant in this effluent by the spiking approach, species sensitivity approach, and deletion approach. Calcium, potassium, magnesium, sodium, fluorine, sulfate ion concentration was not shown toxicity from *D. magna*. Finally, we concluded that chloride was the most contributing toxicant in the waste water treatment plant. Further research activities are needed for technical support of toxicity identification and evaluation on the various types of wastewater treatment plant discharge in Korea. Acknowledgement: This research was supported by a grant (16IFIP-B089911-03) from Plant Research Program funded by Ministry of Land, Infrastructure and Transport of Korean government.

**Keywords :** TIE, *D. magna*, *V. fischeri*, seawater desalination facility

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