

4th

International Symposium on Carbon & Functional Materials for Energy & Environment

(4th CMEE)

Feb
19-22,
2025

2/19: Registration & Workshop
2/20-2/21: Main symposium
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Topics

[Poster 73] Comparison of exposure to fluorine contaminated soil using health risk assessment approaches to hypothetical site

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ABSTRACT

The geological environment has widely distributed various essential elements; fluorine is one of the 13th most abundant elements in the Earth's crust. [1]. Fluorine occurs in the environment mainly as the minerals fluorapatite ($\text{Ca}_5(\text{PO}_4)_3\text{F}$), cryolite (Na_3AlF_6), fluorite (CaF_2), and topaz ($\text{Al}_2\text{SiO}_4(\text{FOH})_2$) [2]. The average fluoride concentration is 204.5 mg/kg in soil [3]. The fluoride is harmful to the liver, kidney, nervous system, reproductive system, and skeleton [4].

Human risk assessment in the soil was conducted using the Risk Assessment Guidance for Superfund method and Soil Risk Assessment Guidance of Korea method. Various fluorine concentrations (200, 400, 800, 2,000 mg/kg) were used as soil concentration parameters. Groundwater, used as a drinking water source, was considered with concentrations of 0.5, 1, 1.5, and 2 mg/L. Predicted values for the Hazardous Index were estimated using fluoride concentrations in the soil, and they were found to be below 1. The predicted values for scenarios involving groundwater as a drinking water source were also estimated and remained below 1 when considering adults as receptors.

Keywords: *Fluoride, Soil, Human Risk Assessment, Regulations, Groundwater, Korea*

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Reference

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