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Application of Mobile Electron Beam for Remediation of Soil and Groundwater Contaminated with Leachate from Animal Carcass Burial Sites

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Leachates of livestock burial sites have raised a concern regarding their potential impact on the environment and public health in Korea. They contain high concentrations of organic and inorganic contaminants, and pathogenic microorganisms such as *Campylobacter jejuni*, *Salmonella* spp., *Clostridium perfringens*, and *Shigella* spp. Several studies have attempted to remove contaminated groundwater by leachates, but an effective method has not been found. Thus, the objective of this study was to treat leachates from livestock burial sites using a combined process of pre-treatment and an electron beam. The pre-treatment system consists of two columns: activated carbon and zeolite. Leachates used in this study were collected from groundwater near a livestock burial site located in Gyeonggi-do, Korea. The removal efficiencies of suspended solids and total organic carbon were 98% and 77% by an activated carbon process, respectively. NH₃-N was removed about 80% through the zeolite process. In addition, microorganisms showed a removal efficiency of 99.99% using an electron beam at an absorbed dose of 2 kGy. Consequently, the combined processes of pre-treatment and an electron beam can be applied to the remediation of groundwater contaminated by leachates.

Country/Organization invited to participate

Korea, Republic of

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