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ASSESSMENT OF WASTE SLUDGE CHANGES DURING SOLAR DRYING

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Abstract

This research presents the efficiency of an air-based solar drying system for providing comprehensive information on optimal management of the wastewater treatment plant sludge (WWTPs) by using renewable energy. The solar drying method was appropriate for utilizing facilities to remove ammonia and able to inactivate environmentally stable Escherichia coli (E-coli) microorganisms which were dropped 2 logs CFU/gr. The thermal efficiency of the dryer was recognized under the realistic circumstance in summer when the outdoor peak solar radiation was 934 Wh/m^2, also, maximum & minimum indoor temperature varied was between 62°C to 14°C range. The main point of this research was to consider that 2312 Wh/m^2 internal cumulative solar radiation, 32˚C average internal temperature, and 58% average internal moisture were leading factors to remove 1kg sludge moisture from 80% to below10% for this pilot study. This study provides conditions for sludge drying by constructing a special design system for transferring intense hot air from tubes to the system and controlling internal temperature and humidity.

Key words: cumulative solar radiation, optimal management, renewable energy, solar drying system

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