عنوان مقاله:

Improving Biogas Production Performance From Pomegranate Waste, Poultry Manure and Cow Dung Sludge Using Thermophilic Anaerobic Digestion: Effect of Total Solids Adjustment

محل انتشار:

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خلاصه مقاله:

Biogas is one of the most important sources of renewable energy and is considered as an environmental friendly energy source. One of the most important parameter influencing the production of biogas is total solids (TS). Aims: In this study, the effects of different total amount of solids, which consisted of ۵, ۱۰, ۱۵, ۲۰, ۲۵, and ۳۰% treatments, on the biogas production were examined. The solids were obtained at a thermophilic temperature (۵۵°C) from a mixture of pomegranate rind, cow manure, and sludge in ۱۵ days using one-liter glass bottles. Materials and Methods: The influences of TS, volatile solids (VS), pH, and carbon-to-nitrogen ratio on the biogas production volume from optimized TS treatment were also evaluated. In addition, pomegranate peel was pretreated for lignocellulosic destruction. Results: The results showed that the biogas production increased from ۰.۲۷۳ to ۰.۷۳۶ L/day with an increase in TS from ۵ to ۲۵%. The ۲۵% treatment had the highest mean biogas production (i.e., ۰.۷۳۶ L/day). Significant difference was observed between the ۲۵% treatment and all other treatments except the ۲۰% treatment. The regression model showed that the VS was the only parameter that had a significant effect on biogas production. This parameter justified about ۷۴.۱% of the biogas production accuracy. Conclusion: Anaerobic digestion is an appropriate technology to achieve the organic fraction of solid wastes. Due to higher biogas production, dry anaerobic digestion is of more importance than wet and semi-dry anaerobic digestion.

کلمات کلیدی:

Anaerobic digestion, biogas, concentration of total solids, cow manure, pomegranate wastes, poultry fertilizer