Biogas Production from Paper Mill Sludge as a Potential Source of Organic Matter

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Abstract:

The waste from the paper industry continues to increase globally, notably the generated paper mill sludge (PMS), which constitutes a challenging residue to treat and typically ends up in landfills. The recovery of this sludge in the energy sector is very interesting as they are composed of lignocellulosic materials that are highly favorable for methane production in anaerobic environments. The sludge is collected at the unit affiliated with the leading paper production company Faderco in Setif. A physico-chemical characterization of the PMS is carried out (pH, total solids content and volatile solids, ammoniacal nitrogen, alkalinity, and organic acid content). Anaerobic digestion tests are also conducted on both wet and dry phases to determine the methanogene potential. The biogas production yield is 520 m^3/ton in the dry basis and 200 m^3/ton in the wet basis. As for the methane yield, the value is 320 m^3/ton in the dry basis and 120 m^3/ton in the wet basis.

In comparison of PMS with other substrates cereal straw, used grease, agricultural residues, this residue is estimated to be a potential substrate for the methane production.

Keywords:

Paper mill sludge, anaerobic digestion, biogas, recovery, methanogene potential.