Aplikasi proses digestasi anaerobik lumpur biologi instalasi pengolahan air limbah industri kertas=Application of an anaerobic digestion process of biological sludge of paper industry wastewater treatment plant

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Abstrak

A continuous pilot scale the study has been conducted to investigate the effectiveness of anaerobic digestion of biological sludge. The sludge has a total solid content of 0.53 % - 1.1 %, pH of 7.20 to 7.32. Its organic content is about 97%, the research were conducted in two stages, which are acidification (performed in 3 m3 the continously stirred tank reactor/CSTR at pH of 5.5 to 6.0) and methanation (performed in 5 m3 the up flow anaerobic sludge blanket/UASB reactor at pH 6.5 to 7.0). The retention time (RT) was gradually shortened form 6 days to 1 day for acidification and from 8 days 2 days for methanation. The result showed that operating the CSTR at the RT of 1 day and the organic loading of 8.23 g volatile solid (VS)/m3. Day could produce biogas at an average value of 66.3 L/day, with an average methane content of 69.9%, methane rate of 0.17 L CH/g COD reduction or 19.06 L CH4/kg VS. Furthermore, methanation could reduce COD at an average value of 51.2%, resulting in the effluent average value of COD filtrate and COD total of 210.1 mg/L and 375.2 mg/L, respectively