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Effects of calcium oxide and iron (III) oxide on biogas production and hydrogen sulphide mitigation

Biogas, as a renewable energy source, has gained attention due to its potential to reduce greenhouse gas emissions and provide sustainable alternatives to fossil fuels. However, its widespread adoption is hindered by challenges such as low methane (CH_4) content and corrosive impurities such as hydrogen sulphide (H_2S), which limit its efficiency and application. This ongoing study explores the influence of metal oxide additives, specifically calcium oxide (CaO) and iron (III) oxide (Fe_2O_3), on methane concentration and hydrogen sulphide monitoring during the anaerobic digestion of cow dung in a control temperature of 37°C . The experimental investigation involves treating cow dung with varying concentrations of CaO and Fe_2O_3 , ranging from 20 mg/L to 100 mg/L, to determine the optimal dosage for enhancing methane concentration and quality. The results will highlight the varying effectiveness of these metal oxides in enhancing CH_4 concentration and reducing H_2S levels, providing valuable insights for optimizing anaerobic digestion towards more efficient and sustainable biogas production.

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