Implications for Biogas Energy Use via Methanogenesis in Mars Conditions

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Future proposed missions to send humans to Mars for long term exploration requires the development of improved waste management technology in space and increased reliable energy for running necessary systems. In this study, the potential of methanogenic bacteria from wastewater sludge to be a source of biomethane in the atmospheric composition of Mars was explored. Bottles of wastewater containing methanogens were prepared anaerobically and sparged with either nitrogen (control) or a martian gas mixture and their biogas production was tracked over time. It was demonstrated that the bacteria produced 48.18% of that produced by the control group. The findings suggest anaerobic digestion in the gases of Mars' atmosphere to be a viable solution for reducing human waste and recycling it to produce biomethane for the production of energy.

Awards Won:

Third Award of $1,000

American Institute of Aeronautics &amp Astronautics: Second Award of $1500.00