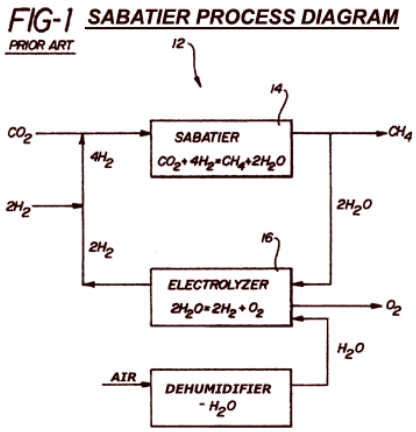
CONTINUED EXPLORATION OF THE COSMOS THROUGH THE USE OF THE SABATIER REACTION TO SUPPORT LIFE SUPPORT AND PROPELLANT MANUFACTURING.

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Abstract

Statement of the problem: The most threatening and possibly the most challenging obstacle that is blocking our journey to the edges of the solar system and Mars is the lack of a life support system, and it has been hypothesized that the Sabatier reaction could lead us to a solution. Methodology and Theoretical Orientation: The Sabatier reaction requires carbon dioxide and hydrogen as inputs, and is capable of producing methane and water which would enable mankind to refill the visiting spaceships and replenish our life support systems with drinkable water and breathable air. Currently, this system is in use on the International Space Station (ISS) with the ability to capture exhaled carbon dioxide and provide the crews with more oxygen to breath. This has allowed the ISS with a nearly closed-loop cycle between water, oxygen, and carbon dioxide and substantially decreases the required amounts of each substance that each resupply mission must carry. Conclusion and Significance: This system will allow us to continue our exploration of the cosmos and decrease the amount of resupply ships required at the beginning and allow us to eventually have a self-sustaining colony on Mars and throughout the solar system. Laboratory testing of the Sabatier reaction using various catalyst materials is ongoing, and so far the results look very promising and point to a Sabatier methanation reactor being the key to continued long duration manned space applications and colonizing.

Image



Recent Publications

1. Junaedi, Christian, Kyle Hawley, Dennis Walsh, Subir Roychoudhury, Morgan B. Abney, and Jay L. Perry. "Compact and Lightweight Sabatier Reactor for Carbon Dioxide Reduction." (n.d.): n. pag. Web. 24 Oct. 2016
2. Barbarossa, V., and G. Vanga. Methanation of Carbon Dioxide. Rome, Italy: n.p., n.d. PDF.
3. Strumpf, H., Chin, C., Lester, G., and Homeyer, S., "Sabatier Carbon Dioxide Reduction System for Long-Duration Manned Space Application," SAE Technical Paper 911541, 1991, doi:10.4271/911541.
4. Matsumoto, H., Ito, S., Hatano, S., Kita, Y. et al., "CO2 Reduction with Sabatier Method," SAE Technical Paper 981716, 1998, doi:10.4271/981716.
5. Forsythe, R., Verostko, C., Cusick, R., and Blakely, R., "A Study of Sabatier Reactor Operation in Zero “G”," SAE Technical Paper 840936, 1984, doi:10.4271/840936.



Biography

Elliott Olson utilizes his expertise and enthusiasm of outer-space to best suit the issues and problems that persist throughout the continued exploration of the cosmos and search for ways for mankind to travel beyond our current grasps. He began his career as a software engineer but has transitioned his focus to Aerospace Engineering to make a much bolder impact on the world around him. Olson continues to push himself to absorb more information and hopes to one day be on the team that sends humans to Mars and beyond.