Inflated Fabric Habitat for Martian Surface and Nanoscale Life Support Catalysis

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Abstract—This project focuses on two key components of a manned mission to Mars: habitat systems and life support systems. These two areas of mission design have presented major obstacles in the past. Our research involves analyzing these areas from a different perspective and providing innovation through the use of state-of-the-art materials and technologies.

Space missions involving a prolonged stay on an extraterrestrial surface necessitate the use of a habitation system. We will present a design for a multi-layer fabric-based inflatable structure. This system will include a flexible airlock, modular radiation shield pods, and an advanced air control and filtration system.

The second component of this project focuses on life support systems. Current life support systems that utilise the Sabatier reaction use macroscale metallic pellets as their catalyst to combine hydrogen and carbon dioxide in order to produce methane and water. Nanoscale catalysis is an emerging field, with much of the studies focusing on how the efficiency of catalyzed reactions can be improved by higher surface area catalyst materials. Our research investigates the effects that catalyst surface area has on the Sabatier reaction. When using nanoscale particles versus macroscale particles, you will inevitably decrease the total mass of catalyst material. As a result we will compare the effects of an increase in surface area with the effects of a decrease in total catalyst mass in order to optimise efficiency.

Index Terms—Computer Society, IEEEtran, journal, LATEX, paper, template.

1 Introduction

MANNED exploration of our solar system has been stalled since mankind first walked on the moon forty years ago. While many probes, robots, and satellites have been launched to gather scientific data, people have not ventured far beyond our planet. The obvious next step has always been to send humans to Mars, but the difficulties of a manned mission to the Red Planet are daunting. Development of the necessary technologies for keeping a crew of astronauts alive for the lengthy trip and surface stay is an as-yet unanswered challenge, making human safety and life support an important focus of any mission planning.

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2 Conclusion

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Appendix A
Proof of the First Zonklar Equation

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Appendix B

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Michael Shell Biography text here.

John Doe Biography text here.

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