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Mars Exploration – missions current and future (3A)

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IN-SITU PROPELLANT PRODUCTION ON MARTIAN SURFACE

Abstract

Martian colonization has been a key focus for human space flight since several years. For the colonization on the mars, various technological demands plays a vital role. NASA's mars rovers has paved a way for Martian exploration for humans. For the human space flight to travel from Earth to Mars and vice-versa, storing and shipping of the fuel becomes a key challenge. In-situ production of fuel such as oxygen and methane for the return to Earth, would definitely have a major impact in reducing the mass of the spacecraft or lander. Since carbon dioxide is available abundantly on the surface of the mars, in this paper, we are proposing a concept to design a system, which assists in converting carbon dioxide to methane in large quantities with minimum power consumption and has limited payload mass. The design also gives the solution of storage of the large quantities. The design of the system takes into consideration the surface conditions of the mars such as the temperature, pressure, composition of the elements in the atmosphere.