Life Supporting System on Mars

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Deferent expeditions to Mars have proven the existence of frozen water in the crust and rocks. The physical and the chemical analysis have mention that this frozen water contains a huge amount of CO2. This condition might prevent human being from any utilization. The aim of our project is to develop a prototype to extract fresh water from frozen acidic water. The process of clean water extraction started by melting the frozen water using a heater powered with photovoltaic panel. The second stage consists of removing CO2 from the liquid water with photosynthesis mechanism. Spirogyra algae will be the catalyzer of the photosynthesis. The obtained water will be sterilized with evaporation. Finally the harvested water will be chemically balanced to make it potable. This concept was transformed into a prototype composed of four rooms for melting the acidic water, the removal of CO2, the sterilization and the fresh water harvesting. All the operations were controlled with O2 and water level sensors. These sensors collect real-time data. The interface of real-time data collection was developed by C++ language. The prototype was designed for 3k of ice and powered with photovoltaic panel with a capacity of 100 w. The different tests have shown that the production of drinkable water requires between 15 to 20 minutes.

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