

OXYGEN FROM WATER

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EXECUTIVE SUMMARY

This report describes in detail how a new process, which uses a manganese complex to produce oxygen from water, can be utilized in the space industry primarily for human exploration of Mars. This process is more advantageous than electrolysis, the process in current use, because it uses approximately 38% less energy. This process can be contained in a fairly small volume, depending on the application. For example, a unit that is capable of producing 1200 moles of oxygen per day (enough to support 5 human adults) could be contained in a 3 ft. by 3 ft. by 2 ft. volume. It consists of 4 reactors, 1 separator, and 3 pumps. The equipment cost is around \$295,000. The normal operating temperatures for all the reactors and separators are maintained near 25 °C. The pressures for these reactors are 9 atm.