

HUMAN EXPLORATION OF THE MOON AND MARS SYMPOSIUM (A5)
Long Term Scenarios for Human Lunar Presence (2)

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ISRU DEMONSTRATOR FOR PROPELLANT PRODUCTION ON THE MOON

Abstract

Recently, various studies in co-operation between German industry and Academia have dealt with the extraction of solar wind implanted particles from moon regolith. In the so-called LUROP project, led by German industry (Kayser-Threde), a concept for a demonstrator for propellant production, i.e. Nitrogen and Hydrogen, on the Moon has been studied.

In contrast to oxygen pyrolysis which uses lunar material and requires demanding process temperatures the extraction of chemicals such as nitrogen and hydrogen from lunar regolith is simpler and less risky. Mid term aim is a demonstrator for propellant production on the Moon, to proof the feasibility and to prepare future production plants.

A first stage demonstrator will be composed of an oven chamber in which the regolith will be homogeneously heated up to temperatures around 1000C by solar thermal energy from the sun using a foldable mirror.

The reaction product will be monitored using a small compact mass spectrometer. A two year development program has been started late 2009 by German industry and the Technische Universität München. It aims at reaching a TRL 5 to TRL 6 in 2013.

The demonstrator for propellant production on the moon is estimated to have a mass of 30kg. The running study and its activities include development test and verification of moon regolith simulates with implanted "solar wind" particles.