

Rigidized polymer construction materials for Moon exploitation

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Moon industrial exploitation needs a hermetic Moon base large enough for organization of all services for life-support systems, energy-producing unit, storage of air and water, greenhouse and so on. The best way is inflatable and deployed light constructions which are transported to the Moon in packed position. The construction has to be soft at deployment and hard at exploitation. A real way for rigidization of deployed structure is a chemical reaction which forms a hard frame of construction.

The rigidization technology of large-size moon module for industrial and scientific applications is developed on a composite material with polymer matrix. Experimental and theoretical investigations of chemical reactions in composite materials under Moon surface conditions (high vacuum, charged particles and high energy irradiations, temperature variations) were carried out. The results showed a possibility to use a liquid viscous polymer matrix of composite materials under space conditions without hermetic coating. The effects of initiation of the polymerisation reaction under simulated space factors were observed.

The polymerised frames can be used for energetic, electronic and other industries on the Moon surface.