

MICROGRAVITY SCIENCES AND PROCESSES SYMPOSIUM (A2)
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INDIAN MICRO-G EXPERIMENTS PROGRAMME : PRESENT STATUS AND FUTURE
DIRECTIONS

Abstract

Indian Micro-g experiments programme encompasses two major elements: (i) processing in orbital space, and (ii) 1-g reference studies. First mission of Space capsule Recovery Experiment (SRE) provided excellent opportunities for conducting micro-g experiments on quasicrystal growth and biomimetic material synthesis using an Isothermal Heating furnace and a Biomimetic Reactor payloads, respectively. While the former experiment validated the physical phenomena on which the scientific rationale of the experiment was based, the latter experiment enabled an insight into the process of aligned self-assembly of nano-structured particles of a biomimetic bone-like material. The experiments proposed for the second SRE mission include study of the growth of “animal as well as plant kingdom based” bacteria, studies on medicinal plant seeds and liquid phase sintering of powder metallurgy based products. This mission will be followed by a series of recoverable space capsules under Human in Space programme. Work is in progress at various RD and academic institutions in the country for the 1-g reference and simulated micro-g materials processing research. A wide range of studies have been taken-up on non-equilibrium solidification of metals and alloys employing the recently commissioned Electromagnetic Levitation Facility. The present paper aims at providing a programmatic overview of the field of micro-g materials processing in India.