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EXPLORING SILICON CRYSTALLIZATION IN LUNAR MICROGRAVITY: A PROPOSED  
PAYLOAD EXPERIMENT

**Abstract**

The objective of the designed experiment is to investigate the effects of lunar microgravity on the growth and quality of silicon crystals. The experiment will be conducted using a silicon crystal growth furnace placed on the lunar surface, designed to accommodate a variety of sample configurations, including seed-assisted and seedless growth methods. The experiment will study the impact of lunar microgravity on crystal morphology and defect formation, thermal transport properties of the silicon crystal, and its interactions with the lunar regolith.

The experiment will be designed to achieve controlled conditions of temperature, pressure, and other relevant factors, enabling precise measurements of crystal growth parameters. The samples will be heated to a high temperature and then cooled, allowing for the growth of large, high-quality crystals. The experiment will be conducted for a specific period, with measurements taken at regular intervals to monitor the crystal growth process.

The results of the designed experiment will provide valuable insights into the effects of lunar microgravity on the growth and quality of silicon crystals, including crystal morphology and defect formation, thermal transport properties, and interactions with the lunar regolith. The experiment will also provide important information about the potential challenges and opportunities associated with using lunar materials for silicon production. Furthermore, the results of the study will contribute to the development of advanced electronics and solar cells by providing a deeper understanding of crystal growth and the potential impact of lunar materials on silicon production.