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PROPOSAL FOR THE CONSTRUCTION OF CLEAN ENERGY-GENERATING BASES FOR FUTURE SETTLEMENTS. LUNAR POWER REGOLITH UNIT. LRPU

Abstract

Introducing the Lunar Regolith Power Unit (LRPU): a groundbreaking 7-meter tall structure designed to harness the untapped potential of lunar regolith for sustainable energy production. With the capacity to store 3 tons of lunar regolith, this innovative unit operates as a perpetual energy source, functioning for months on end. Crafted from resilient ceramic materials capable of withstanding temperatures exceeding 5000 degrees Celsius , the LRPU leverages piezoelectricity to heat the lunar regolith, inducing internal vibrations that generate essential heat. Comprised primarily of conductive lunar regolith rich in metallic compounds, including silicates, metallic oxides, volcanic glass, iron minerals, and titanium, the unit's regolith pile absorbs heat, initiating crucial electrochemical processes. Lunar Regolith Power Unit (LRPU) is a 7-meter stack with the capacity to store 3 tons of lunar regolith, designed to produce sustainable energy for months. Its structure consists of an hourglass-shaped stack primarily made of ceramic, capable of withstanding the 5000 degrees Celsius required to generate energy. Our method involves using piezoelectricity to heat the lunar regolith; under pressure, the piezoelectric crystal will vibrate, causing the interior of the stack to rotate and heat up. Conductive sand is used, with lunar regolith primarily composed of metals such as silicates, metallic oxides, volcanic glass, iron minerals, and titanium, among other components. The lunar regolith stack is exposed to high temperatures, leading to heat absorption by the regolith. This heat is essential to activate the electrochemical process, forming an electrochemical cell in the presence of high temperatures. This process involves reactions that release electrons. The released electrons move through an external circuit, generating electricity that can be used to power our construction structures. It may involve the release of oxygen, producing chemical compounds such as molten silicon. These compounds participate in the process and contribute to energy generation. The regolith used in the process can be recycled and reused, making the lunar regolith stack a potentially sustainable system. It will have a chamber where the same heat it produces can melt and process materials.