

**PROPERTIES OF THE VOLATILES EXTRACTED FROM THE LUNAR REGOLITH** Y. Inoue<sup>1</sup> G. Kletetschka<sup>2,3,4</sup>, J. Lindauer<sup>5</sup>, M. Takac<sup>4</sup>, R. Kavkova<sup>4</sup>, N. Hasson<sup>2</sup>. <sup>1</sup>Department of Electronics and Materials Science, Shizuoka University, 3-5-1 Johoku, Nakaku, Hamamatsu, 432-8561, Japan. <sup>2</sup>Geophysical Institute, University of Alaska Fairbanks, AK, USA (gkletetschka@alaska.edu), <sup>3</sup>Institute of Geology, Czech Academy of Sciences, Czech Republic, <sup>4</sup>Department of Applied Geophysics, Charles University, Czech Republic. <sup>5</sup>Faculty of Electrical Engineering, Czech Technical University in Prague, Czech Republic

**Introduction:** Moon's regolith contains volatiles besides water. The development of nanotechnology allowed to build sensitive, low cost, portable sensors with low power consumption. The extremely high surface-to-volume ratio and hollow structure of nanomaterials is practical for the adsorption of gas molecules. The advent of carbon nanotubes (CNTs) revealed the inventions of gas sensors that exploit CNTs' morphology, unique geometry, and material properties. Upon exposure to certain gases, the changes in CNTs' properties can be detected by various methods. CNTs-based gas sensors have been widely studied [1].

**Methods and results:**

We created vacuum canisters equipped with aligned multiwall Carbon Nanotubes created by chemical vapor deposition technique. Large surface and porosity allows adsorption of gas molecules. Difference gas species allows to get in direct contact with the MWCNT structures. Such contact creates contrasting responses to the increasing current.

**Discussion and conclusion:**

When drilling the regolith on the Moon or other space bodies containing adsorbed volatiles, they can be extracted from the regolith by various drilling systems [2]. We use evacuated containers with functionalized MWCNTs allowing not only adsorption and desorption of the mined space resources but also identification of the gas species extracted from the Lunar regolith. This allows efficient in situ utilization of the volatile content adsorbed on the planetary surfaces.

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