

## 軽ガス銃を用いた小惑星衝突模擬実験によるアミノ酸合成の可能性 Possibility of production of amino acids by impact reaction using a light-gas gun as a simulation of asteroid impacts

大河内 一輝<sup>1\*</sup>; 三重野 哲<sup>2</sup>; 近藤 和彦<sup>1</sup>; 長谷川 直<sup>3</sup>; 黒澤 耕介<sup>4</sup>  
OKOCHI, Kazuki<sup>1\*</sup>; MIENO, Tetsu<sup>2</sup>; KONDO, Kazuhiko<sup>1</sup>; HASEGAWA, Sunao<sup>3</sup>; KUROSAWA, Kosuke<sup>4</sup>

<sup>1</sup> 静岡大学大学院 理学研究科, <sup>2</sup> 静岡大学創造科学技術大学院, <sup>3</sup> 宇宙科学研究所/宇宙航空研究開発機構, <sup>4</sup> 千葉工業大学 惑星探査研究センター

<sup>1</sup>Dept.Physics, Shizuoka Univ., <sup>2</sup>Grad.School of Sci. and Technol, Shizuoka Univ., <sup>3</sup>ISAS/JAXA, <sup>4</sup>Planetary Exploration Research Center, Chiba Institute of Technology

We are interested in the production process of amino acids in space. Especially, asteroids coming to Titan satellite have made impact reaction on the surface including nitrogen gas, water ice and methane. On the Titan surface, various material, produced by the impact reactions, have been stored under low temperature and dark condition. To do the simulation experiment, a JAXA 2-stage light-gas gun has been used. A projectile with 6.5km/s of speed hits a water + iron target in 1 atm of nitrogen gas, causing an impact reaction. Figure 1 shows a crater on the target. Figure 2 shows produced black soot which deposited onto the aluminum sheet. The samples produced are carefully collected and analyzed by HPLC, FTIR, TOF-MS. As a result of HPLC, peaks suggesting the existence of glycine and alanine in the samples produced were confirmed.

Keywords: impact reaction, gas gun, Titan, asteroid, amino acid, HPLC

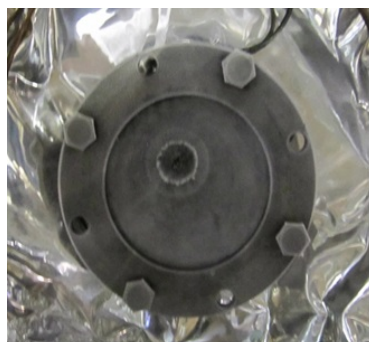


Fig.1 A crater on the target.

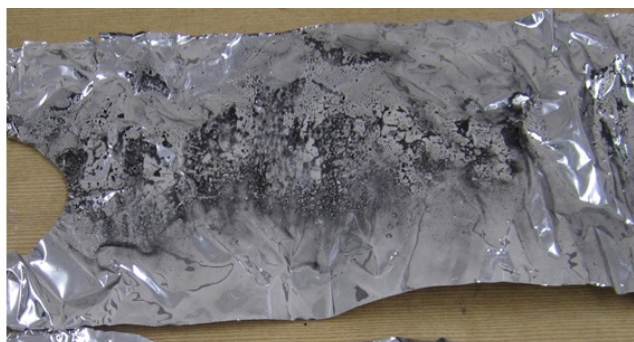


Fig.2 Produced black soot deposited onto the aluminum sheet.