Superlubricity, Super liquid repellency, Triboelectric nanogenerators

CHOI LAB.

Thin Films and Tribology

Department of Fundamental Engineering

Tribology

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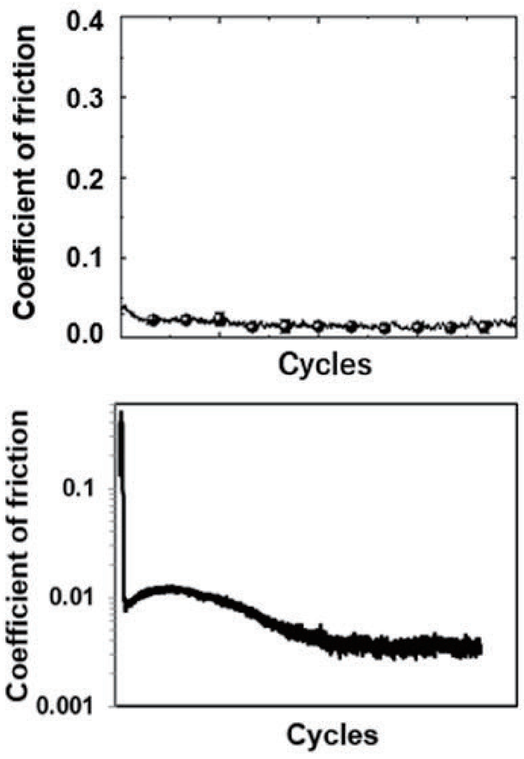
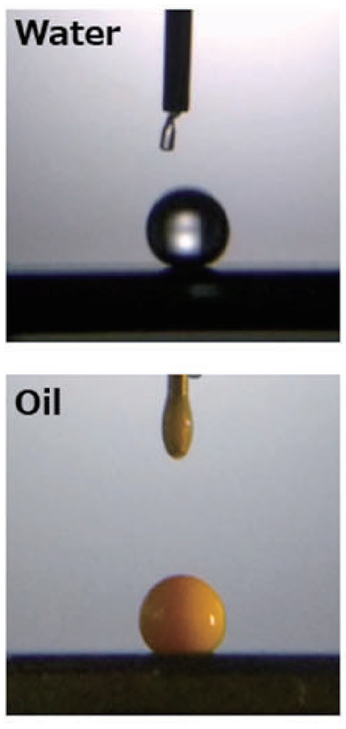
Surface Engineering and Tribology

In the field of surface engineering and tribology, our research focuses on superlubricity (near-zero friction) under ambient conditions. We are also developing highly durable, super-liquid-repellent surfaces capable of repelling both water and oil. In parallel, we are studying on the fabrication ultra-smooth surfaces with atomic-level flatness. To realize three-dimensional architectures of such functional surfaces, we are working on establishing 3D plasma processing and thin-film deposition technologies. Furthermore, we are investigating triboelectric generators that harvest electrical energy through friction and contact between various surfaces. The electricity generated is being utilized to self-powered devices and sensors. Potential applications of this technology include real-time monitoring of sliding bearing operations and the integration of smart features into white canes designed for visually impaired individuals.

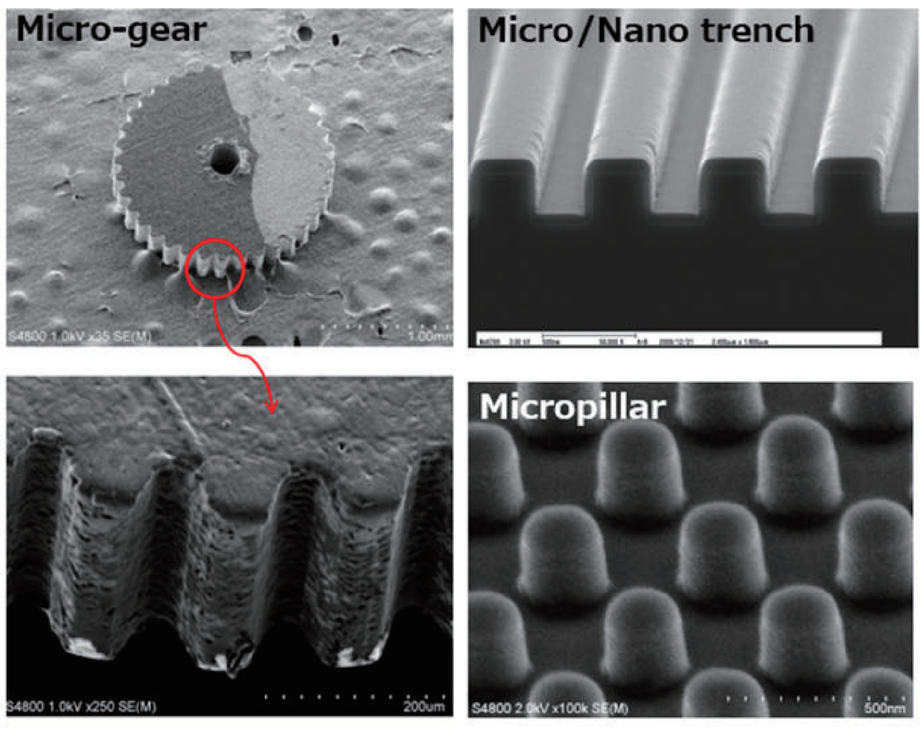
Superlubricity



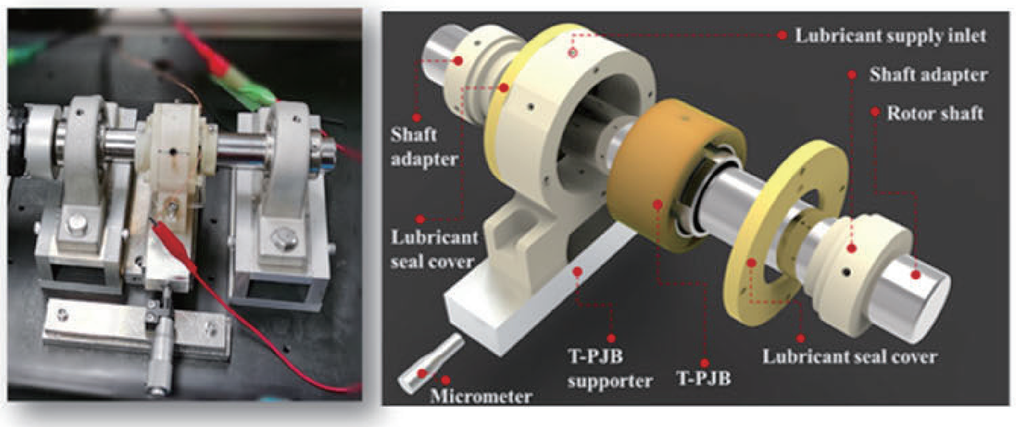
Super liquid repellency



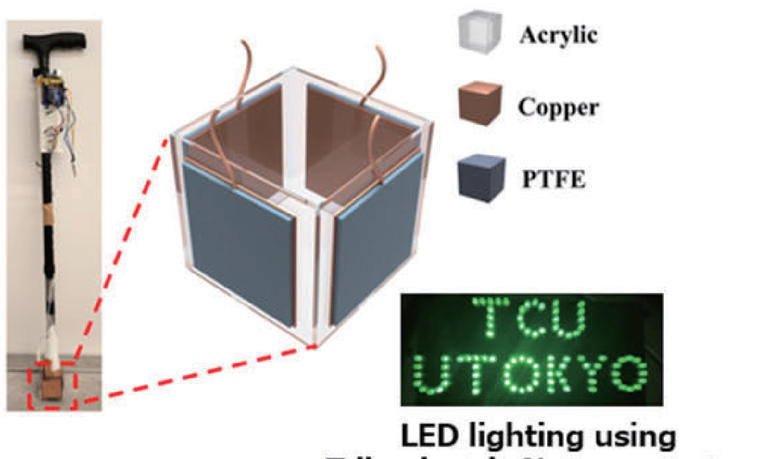
3-D DLC coatings



Smart bearings



Smart walking cane



LED lighting using
Triboelectric Nanogenerator