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Releasing of Sputtered Au Film by Dissolving Sacrificial Layer and Its Self-Standing on Perforated Substrate[1] YU MIYAMOTO, YUMA FUJII, MASAFUMI YAMANO, TORU HARIGAI, YOSHIYUKI SUDA, HIROFUMI TAKIKAWA, Department of Electrical & Electronic Information Engineering, Toyohashi University of Technology, MAMIKO NISHIUCHI, HIRONAO SAKAKI, KIMINORI KONDO, Japan Atomic Energy Agency — Free-standing thin films such as diamond-like carbon (DLC) and gold (Au) have been attracted increasing interests as film targets used in the laser-driven ion acceleration experiment [1]. One of the methods to make the free-standing thin film is to use a soluble sacrifice layer [2]. In this study, the fabrication technique of self-standing Au thin film is presented. Gelatin, oblate, silk fibroin, and NaCl were examined as a. Au thin films were deposited by DC plasma sputtering on sacrifice layers. The gelatin and oblate were used as the sacrificial layer and the supporting substrate. Silk fibroin was coated on glass substrates by a spin coater. The NaCl sacrificial layers were deposited on flat Si substrates by the vacuum vapor deposition system. Sputtered Au thin films were released by immersing the substrates in purified water. Self-standing Au thin films were fabricated by scooping up the released Au thin film on a perforated substrate. The highest quality of the self-standing Au thin film was achieved by using NaCl sacrificial layer.

[1] M. Nishiuchi: J. Plasma Fusion Res., 88, 5-12 (2012)
[2] F. Gao, et al.: Nucl. Instr. and Meth. A, 577, 397-401 (2007)

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