

Abstract Submitted  
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**Fabrication of nanostructured black metals by use of self-growing helium bubbles** SHIN KAJITA, TSUBASA SAEKI, YUKI HIRAHATA, Nagoya University, MIYUKI YAJIMA, NORIYASU OHNO, Nagoya University, REIKO YOSHIHARA, NAOAKI YOSHIDA, Kyushu University — Helium irradiation to metals leads to the morphology change in nanometer scale by the formation of helium bubbles. It is revealed that the morphology change significantly alters the light absorption, and consequently, forms blackened metals. From the detailed TEM (transmission electron microscope) investigation with FIB (focused ion beam) technique, it was revealed that the morphology change was caused by the self-growing helium bubbles in the surface region. After various metals including tungsten, titanium and SUS surfaces are exposed to the helium plasma in a linear plasma device, the total optical reflectance decreased significantly by more than an order of magnitude. Particularly, for W, the optical reflectivity decreased two orders of magnitude, making it the darkest man-made tungsten, which could be used in high temperature circumstances. The results indicate that the helium irradiated metals can be a good medium for light absorber.

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