Short Communication

W and Mo Thin Films Electrodeposited from Aqueous Solutions

M. Saitou

University of the Ryukyus, Department of Mechanical Systems Engineering, 1 Senbaru Nishihara-cho
Okinawa, 903-0213, Japan.

E-mail: saitou@tec.u-ryukyu.ac.jp

doi: 10.20964/2021.01.14

Received: 5 September 2020 / Accepted: 29 October 2020 / Published: 30 November 2020

Thin films electrodeposited from aqueous solutions containing W(VI) or Mo(VI) ions using rectangular pulse voltages with a 1 MHz frequency were investigated using scanning electron microscopy-energy dispersive X-ray (SEM-EDX) spectroscopy and X-ray diffraction (XRD). SEM-EDX analyses confirmed that the obtained thin films comprise W or Mo. The current efficiency increased with the cathode potential and tended to become constant, which is consistent with the phenomenological theory of electrodeposition. The potential barrier of W^{6+} and Mo^{6+} was 6.5 V and the maximum current efficiency (achieved by the W thin film) was 2.3 %. XRD analyses revealed that the W and Mo thin films have a body-centered cubic and amorphous structure, respectively.

Keywords: W and Mo thin films; Aqueous solution; Phenomenological theory; Body-centered cubic; Amorphous

[FULL TEXT](#)

© 2021 The Authors. Published by ESG (www.electrochemsci.org). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).