Electronic Supplementary Material (ESI) for RSC Advances.

Preparation of porous CuO films from $Cu(NO_3)_2$ aqueous solutions containing poly(vinylpyrrolidone) and their photocathodic properties

Hiroaki Uchiyama, Kouta Isobe and Hiromitsu Kozuka

E-mail address: h_uchi@kansai-u.ac.jp (H. Uchiyama).

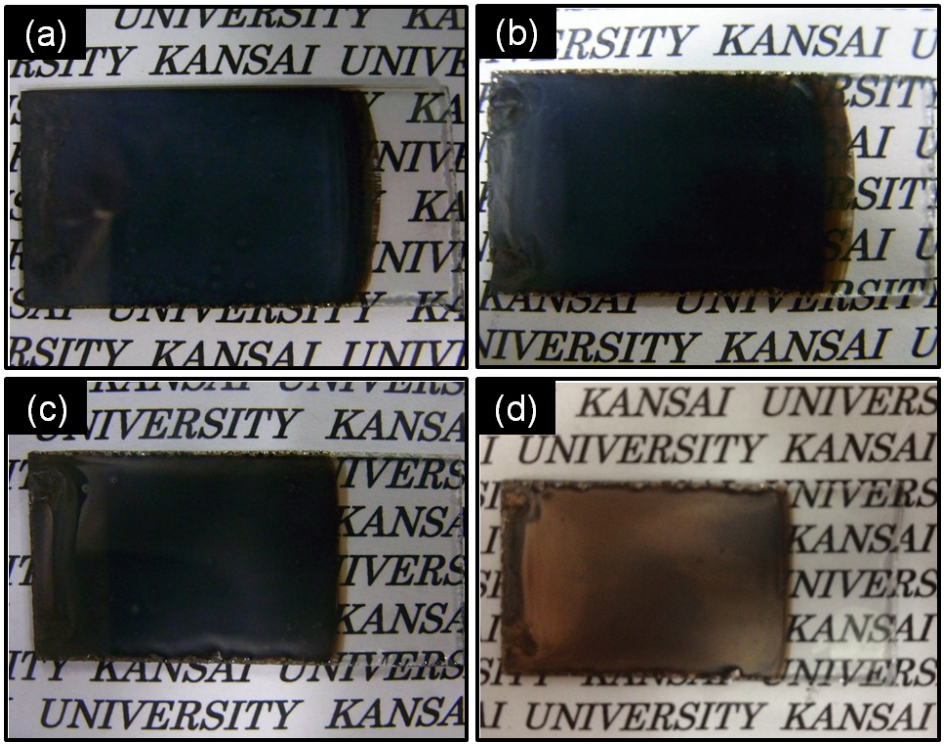

Fig. S1 Optical micrographs of the CuO films prepared at [PVP] = 0.05 M with 10-times coating (a), [PVP] = 0.10 M with 5-times coating (b), [PVP] = 0.25 M with 3-times coating (c) and [PVP] = 0.40 M with 2-times coating (d).

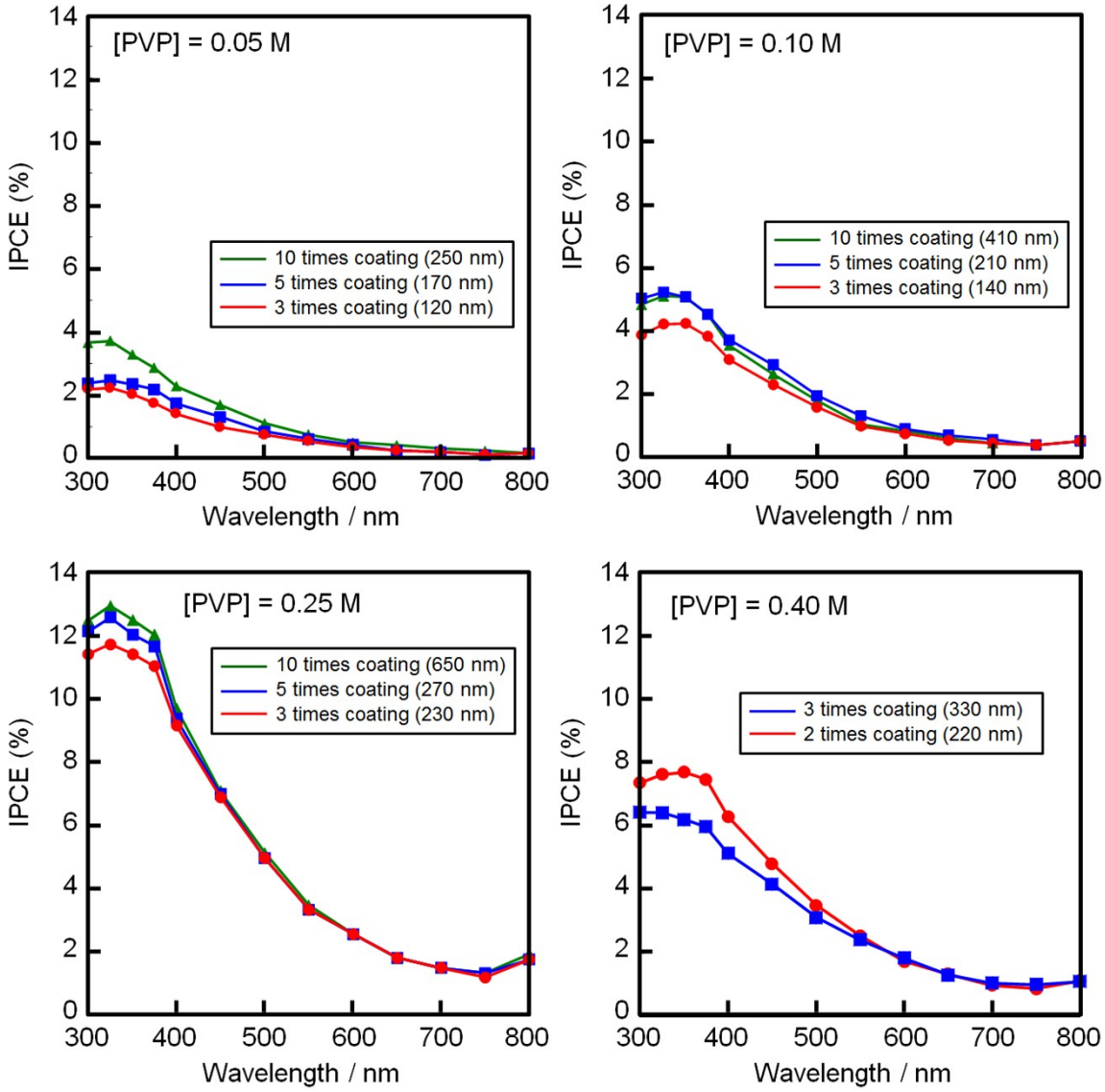

Fig. S2 Action spectra of the CuO films prepared at [PVP] = 0.05 M with 3–10 times coating, [PVP] = 0.10 M with 3–10 times coating, [PVP] = 0.25 M with 3–10 times coating and [PVP] = 0.40 M with 2–3 times coating.

Table S1 Carbon (C) content in Films PVP0.05–0.40

Film	C content / atom%
PVP0.05	2.2
PVP0.10	2.3
PVP0.25	2.0
PVP0.40	0

*In order to remove the dust on the surface of CuO films, the surface etching was done by using Ar^+ ion sputtering before the analysis of chemical compositions.

Table S2 Negative photocurrent of Films PVP0.05–0.40 under the irradiation of white light irradiation*

Film	Photocurrent / μA cm^{-2}		Photocurrent decrease rate / %
	1 s light irradiation	30 min light irradiation	
PVP0.05	-134	-27.4	79.1
PVP0.10	-144	-29.1	79.8
PVP0.25	-246	-34.5	86.0
PVP0.40	-209	-34.9	83.3

* The current-potential curves of Films PVP0.05–0.40 were measured for 30 min at a working electrode potential of -0.1 V vs SCE under the white light.