Electronic Supplementary Information

Low temperature self-reducible copper hydroxide amino-alcohol complex catalyzed by formic acid for conductive copper films

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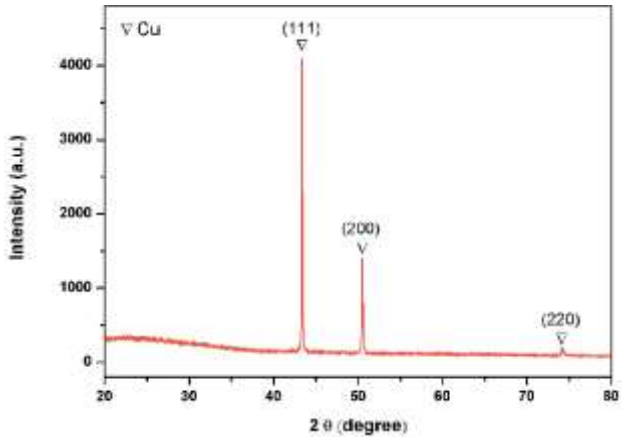

Fig. S1 XRD patterns of $Cu(HCOO)_2$-DMAPD (1:2) sintered at 200 ℃ for 30 min under a nitrogen atmosphere.

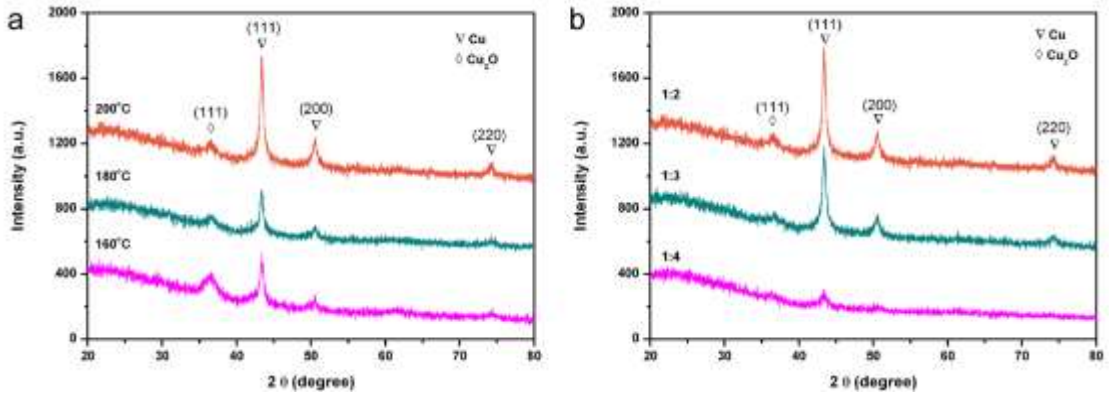

Fig. S2 XRD patterns of (a) $Cu(OH)_2$-DMAPD complex at a molar ratio of 1:2 sintered at 160 °C, 180 °C and 200 °C, (b) $Cu(OH)_2$-DMAPD complex at different molar ratio of 1:2, 1:3 and 1:4 sintered at 200 ℃ for 30 min under a nitrogen atmosphere.

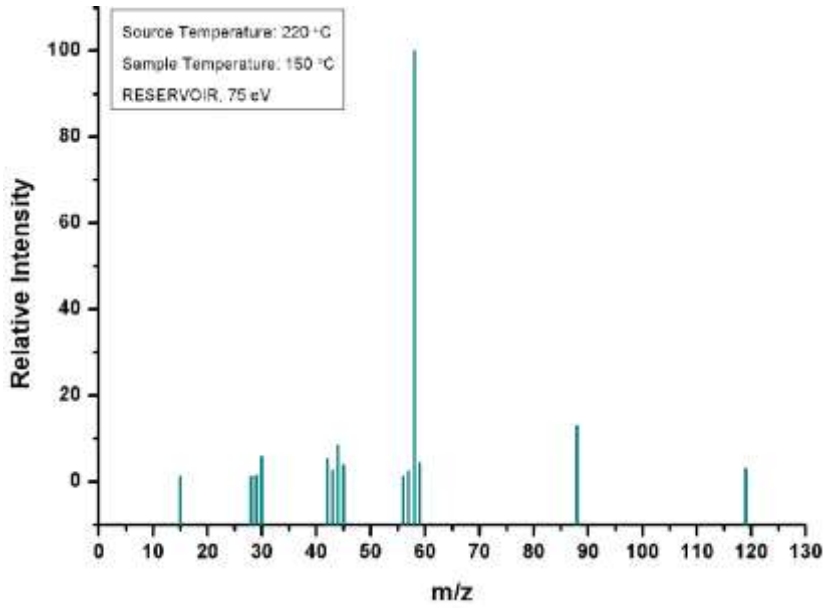

Fig. S3 GC-MS of DMAPD.[1]

[1] MS-IW-0916 SDBS NO. 23771 [EB/OL],

http://sdbs.db.aist.go.jp/sdbs/cgi-bin/direct_frame_top.cgi, 1999-03-31.

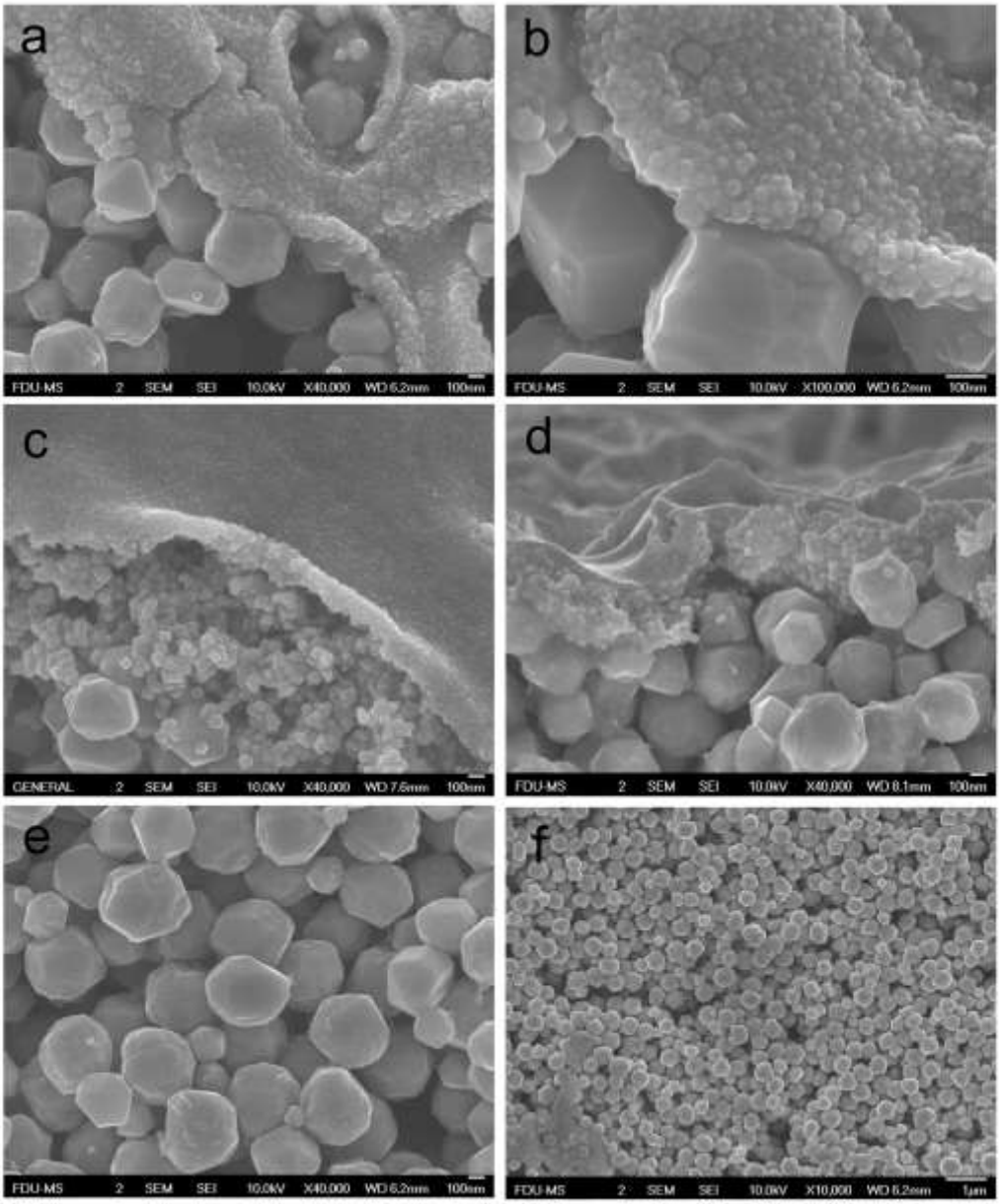

Fig. S4 SEM images of $Cu(OH)_2$-DMAPD-HCOOH (1:2:0.3) sintered at (a-b) 160 ℃, and (c) 200 ℃ (top-view), (d) 200 ℃ (cross-section); and (e-f) $Cu(OH)_2$-DMAPD-HCOOH (1:2:0.5) sintered at 200 ℃ under a nitrogen atmosphere.

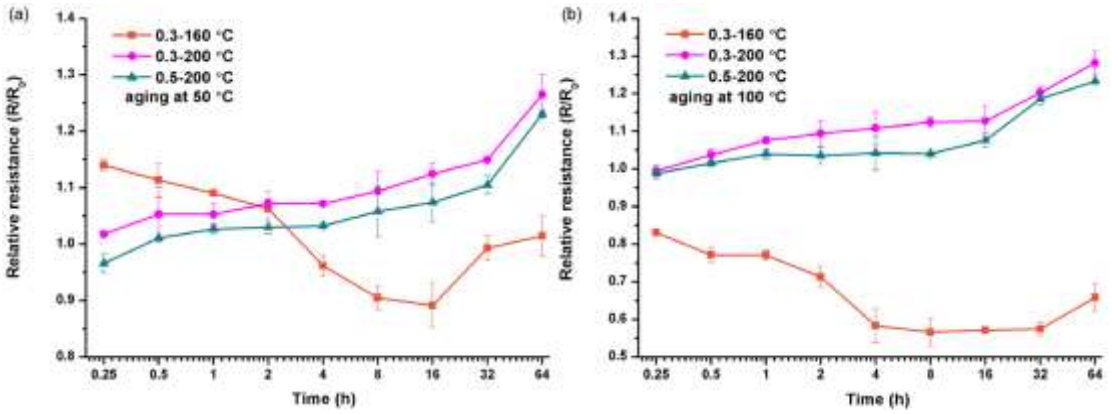

Fig. S5 Relative resistance (R/R_0) of sintered Cu films changes with the aging time at different temperatures (a) 50 ºC, (b) 100 ºC.

The sample denotations in the figures are as follows.

0.3-160 ºC: $Cu(OH)_2$-DMAPD-HCOOH (1:2:0.3) complex sintered at 160 ºC;

0.3-200 ºC: $Cu(OH)_2$-DMAPD-HCOOH (1:2:0.3) complex sintered at 200 ºC;

0.5-200 ºC: $Cu(OH)_2$-DMAPD-HCOOH (1:2:0.5) complex sintered at 200 ºC.