Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.
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Electronic Supplementary Information (ESI)

Enhancement of pressure-free bonding with Cu particles by the addition of Cu-Ni alloy nanoparticles

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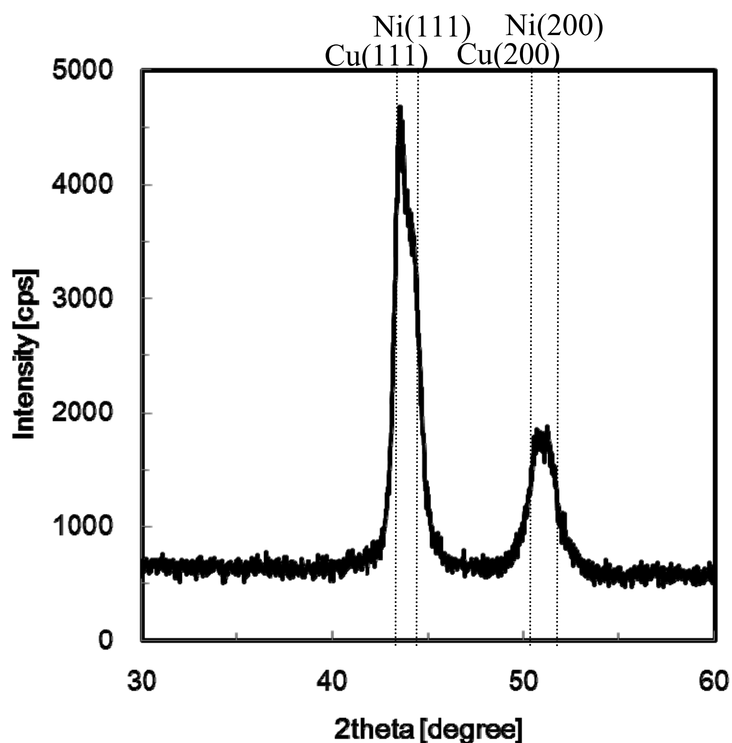


Fig. S1 XRD pattern of the product synthesized by one-pot one step process: the mixture of 1.7 mmol of $Cu(acac)_2$, 1.7 mmol of $NiCl_2$, 30 mmol of OA and 2.4 mmol of TOP was reacted at 200°C for 2 h. Broken lines are the peaks of Cu (JCPDF Card File 04-0836) and Ni (JCPDF Card File 04-0850).

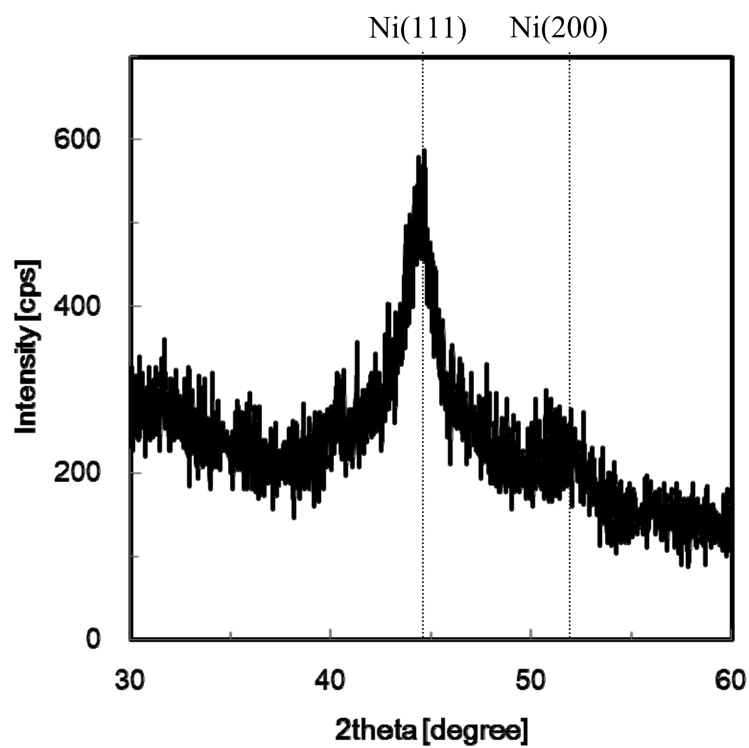


Fig. S2 XRD pattern of the product synthesized by reaction of mixture 3.6 mmol of $NiCl_2$, 30 mmol of OA and 2.4 mmol of TOP at 200°C for 1 h. Broken lines are the peaks of Ni (JCPDF Card File 04-0850).

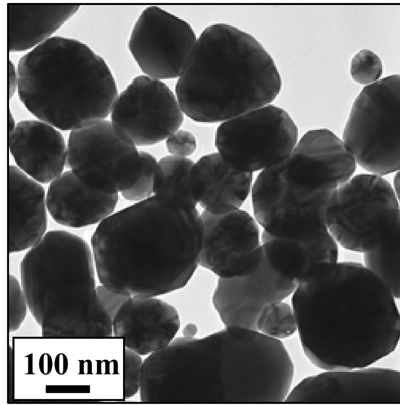


Fig. S3 TEM images of CuPs.

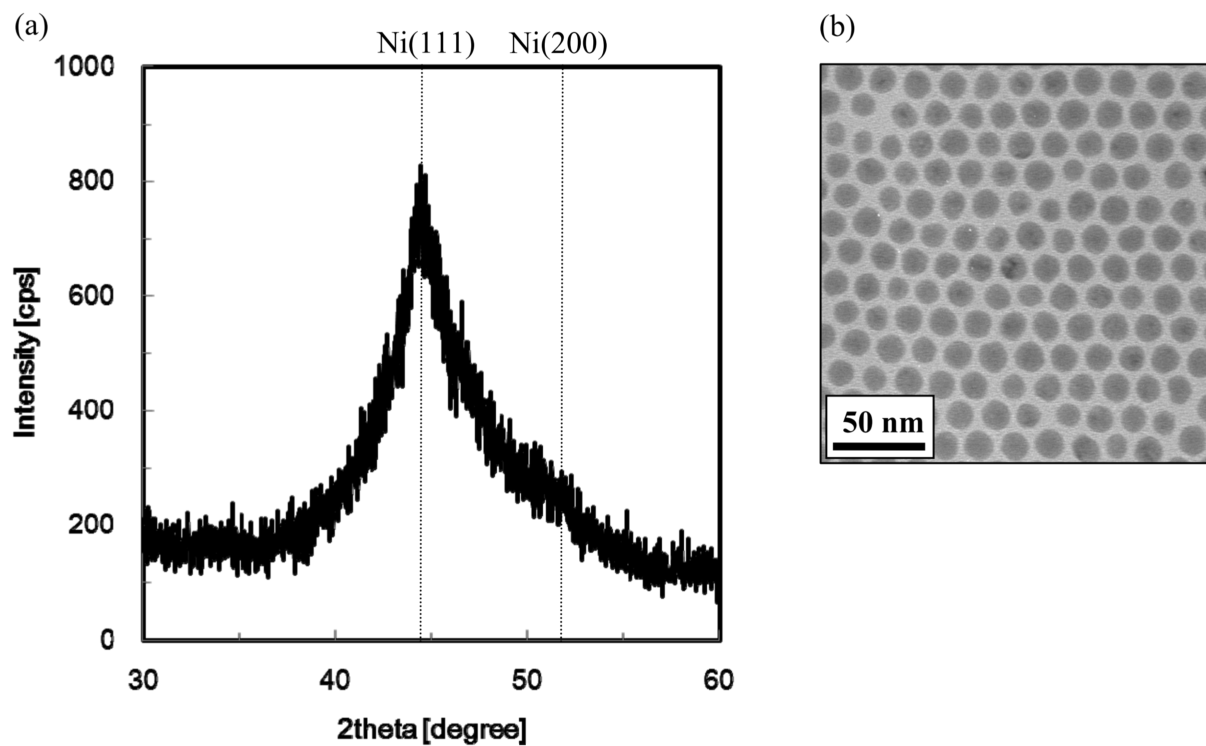


Fig. S4 (a) XRD pattern and (b) XRD pattern of NiNPs. Broken lines are the peaks of Ni (JCPDF Card File 04-0850).

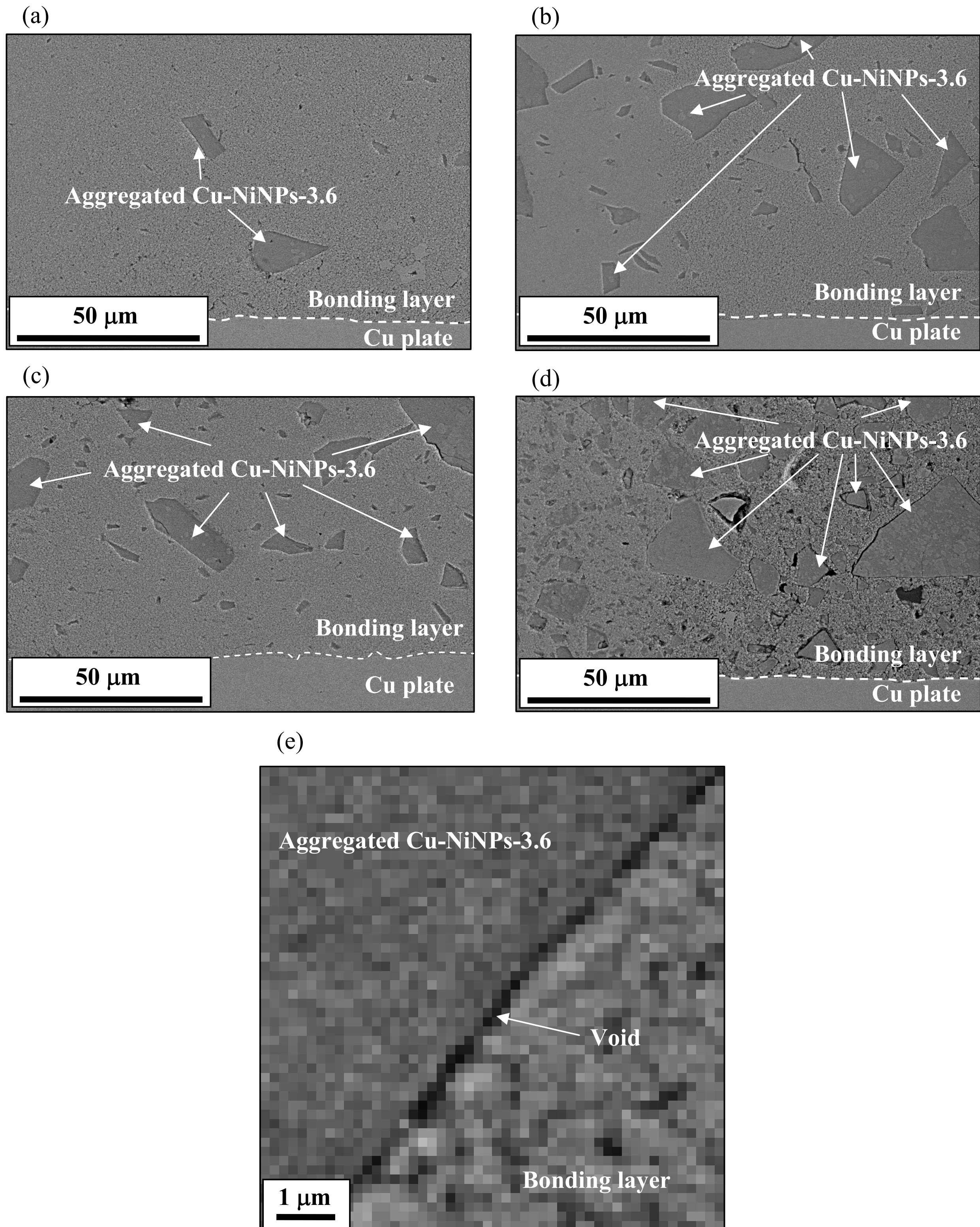
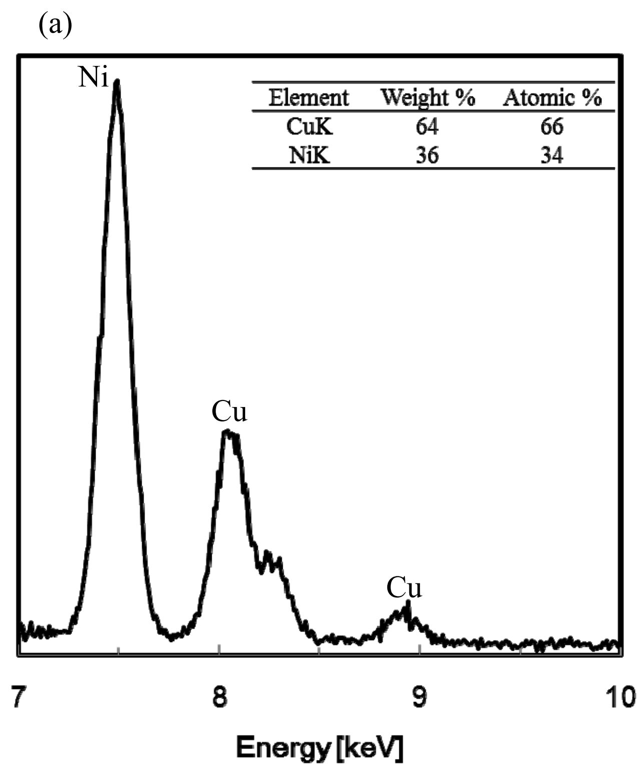


Fig. S5 Low-magnified SEM images of the interface of the Cu plates bonded by CuPs pastes containing (a) 5 wt%, (b) 10 wt%, (c) 20 wt% and (d) 40 wt% of Cu-NiNPs-3.6 at 250°C, and (e) magnified SEM image of interface between an aggregation of Cu-NiNPs-3.6 and the bonding layer.



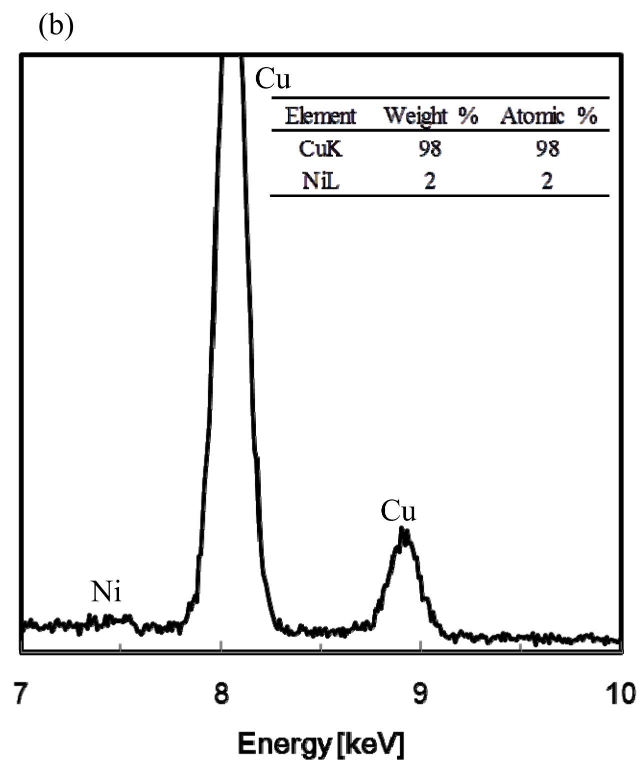


Fig. S6 EDX spectra of (a) the aggregated Cu-NiNPs-3.6 and (b) the bonding layer.

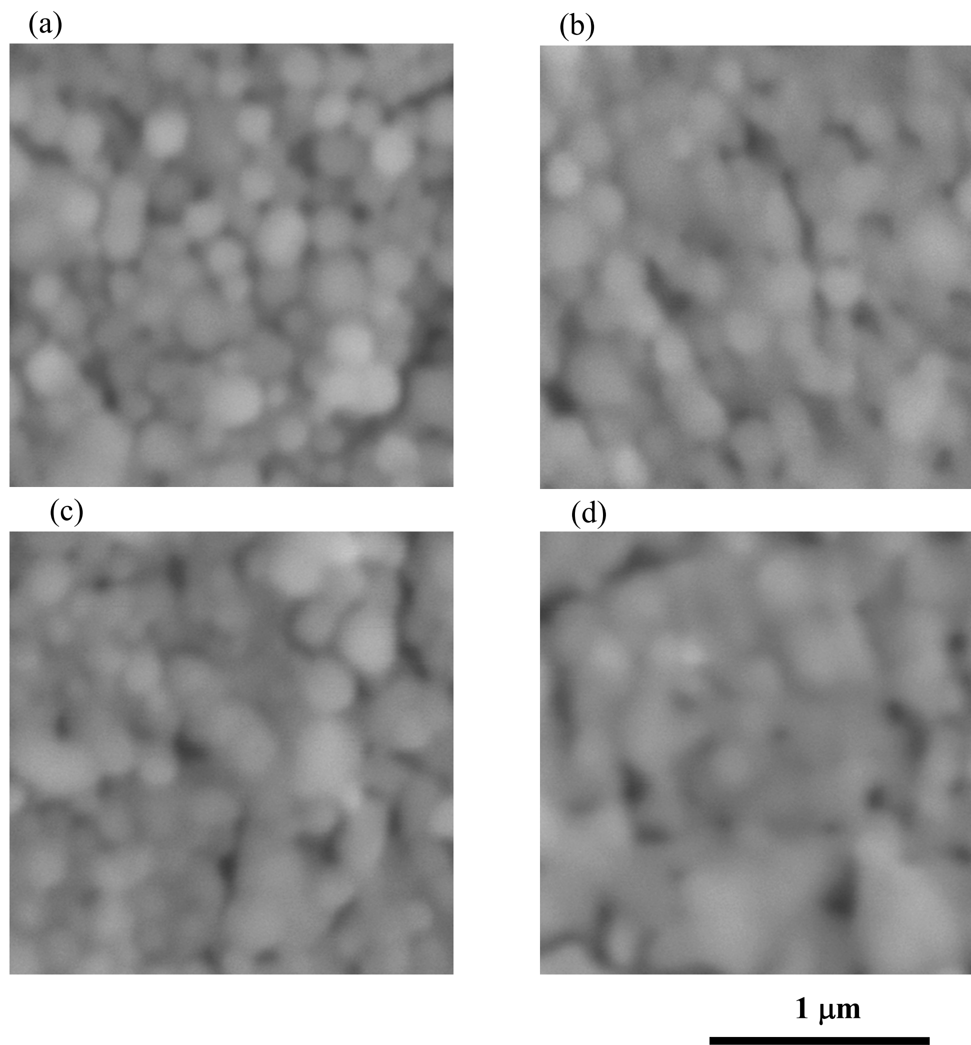


Fig. S7 SEM images of the sintered films prepared using (a, b) the single CuPs paste and (c, d) the CuPs paste containing 5 wt% of Cu-NiNPs-3.6. The sintering temperature are (a, c) 250°C and (b, d) 300°C.