

Supporting Information

One Step Synthesis of Uniform Organic Silver Ink drawing directly on Paper Substrates

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1. Effects of oleic acid on the behavior of the silver lines

The effects of oleic acid additive were understood by improving the surface morphology, continuity and conductivity of the silver lines. As Fig.S1 showed, in the absence of oleic acid, the silver lines contained numerous crystalline domains, whose boundaries were believed to block electrical conduction of the silver line, and led to lower electrical conductivity; in the presence of oleic acid, a homogeneous thin film of the silver lines without discernible crystalline domain boundaries was formed, and a higher electrical conductivity was produced.

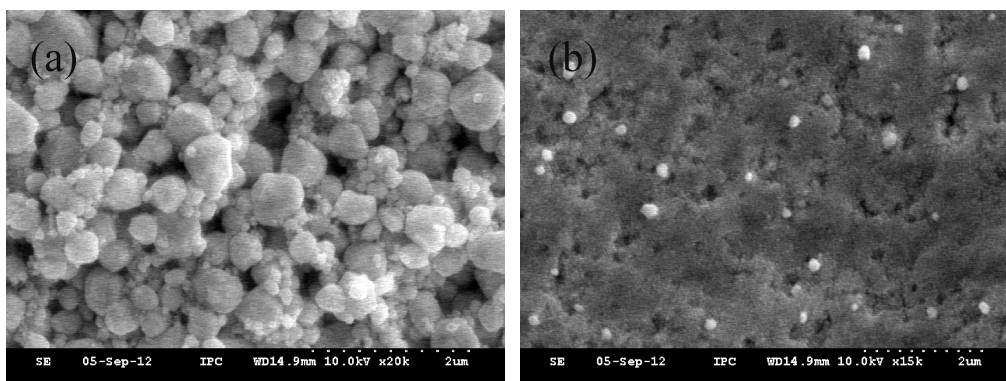


Fig.S1. SEM images of the silver lines from the as-prepared silver ink after sintering at 200°C for 60min: (a) without oleic acid; and (b) with oleic acid

2. The preparation of conductive lines by PoP method

Silver lines were drawn on sulfuric paper using the conductive pen filled with the organic silver ink by direct writing, just like writing on ordinary paper. Fig.2S is the schematic illustration for the preparation of conductive lines by this method.

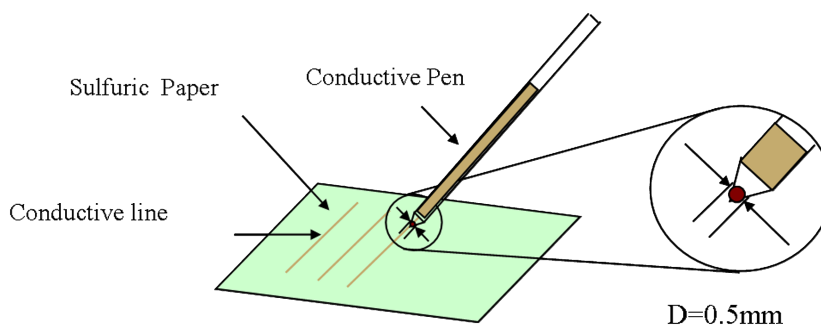


Fig.S2. The schematic illustration for the preparation of conductive lines by a pen-on-paper method

In our research, the interface between the ink and sulfuric paper with a small contact angle of $<30^\circ$ (Fig.S3) due to its low surface tension, which exhibits hydrophilic wetting behavior, facilitates the contact and fanning of the ink on paper.

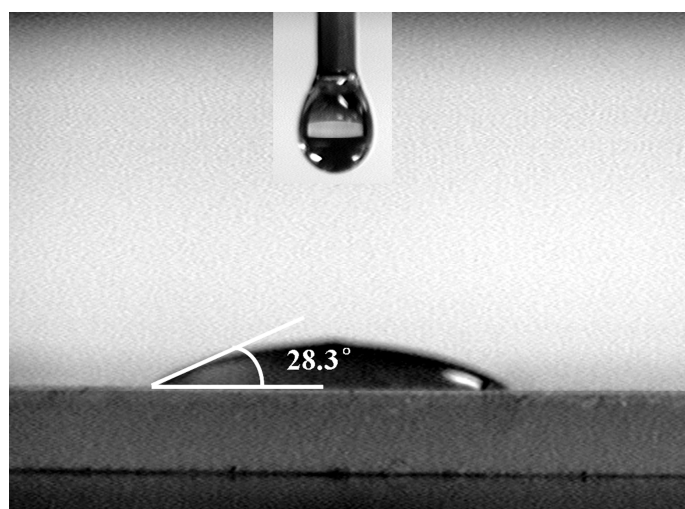


Fig.S3 The contact angle of the silver ink on sulfuric paper

The line-width, line-length and line-thickness were controlled by the writing speed, force and times, respectively (Fig.S4).

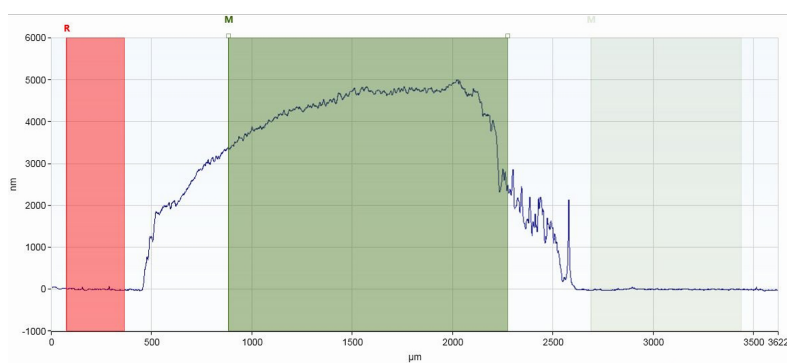


Fig.S4. The line-width and line-thickness of conductive lines obtained by a pen-on-paper method