Development of ultra-high-resolution printed electronics using dual surface architectonics
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This research team recently developed a dual surface architectonic process which can be used to print submicrometer-scale wiring patterns by increasing the chemical polarity of predetermined microscopic areas of a substrate surface, thereby promoting selective adhesion of metallic nanoparticles to these areas. Simple photo and chemical treatments are applied to the substrate during this process. First, preselected surface areas are activated by ultraviolet irradiation. A chemical treatment is then applied to these areas which increases chemical polarity and surface energy only in the UV-activated surface areas. Consequently, the surface's adhesiveness to metallic ink increases precisely in the treated areas. Because both treatments are simple and quick and can be performed in ambient air, use of the dual surface architectonic process is expected to significantly expedite and reduce the cost of printable electronic manufacturing processes compared to photolithography and other conventional printing methods.

Priways Co., Ltd. and C-INK Co., Ltd. have developed a metallic nanoparticle self-assembly system which can be used to print metallic nanoparticle inks at ultra-high resolution. The system will soon be put on sale along with primers specifically designed for use with it to enhance adhesion of metallic inks to different types of substrates. This research team will promote widespread use of this ultra-high-resolution printing technology for the production of printed electronics.

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