

Dispersion of gold nanoparticles on plastic surface

Takeo Minari¹, Asuka Yaguchi¹, Yuki Kanehara², Shigemi Tsukada³, Kei Kashizaki², Masayuki Kanehara^{2,3}

¹WPI-MANA, NIMS, Namiki, Tsukuba, Japan

²Okayama University, Kita-ku, Okayama 700-8530, Japan

³Colloidal Ink Co., Ltd., Sojya-shi, Okayama, Japan

MINARI.Takeo@nims.go.jp

Abstract

Printed electronics has been expected to offer a low-cost, large-area fabrication method of thin-film devices, which may promote spreading of ambient electronics throughout society. On the other hand, the high processing temperatures of ~ 150 °C are still used in current printed electronics technologies. Such the high temperatures significantly limit use of common flexible substrate because of the low heat stability. Here we present a novel method to disperse Au nanoparticles (NPs) on plastic surface. We chose the plastic model as the heat-labile, curving substrate. We developed novel π -junction Au NPs which exhibit low resistivity of $\sim 9 \times 10^{-6}$ Ω cm even after solution-based deposition and drying at room temperature without annealing [1]. We also developed the adhesion layer to disperse the Au NPs on plastic surface, using the spray deposition technique to allow use of the curving substrate. Result of the plastic model painted in Au NPs is shown in Fig. 1. This method can be used not only for painting a plastic model but also for electronics device fabrication.

References

[1] T. Minari, Y. Kanehara, C. Liu, A. Yaguchi, K. Sakamoto, T. Yasuda, S. Tsukada, K. Kashizaki, and M. Kanehara, submitted.

Figures

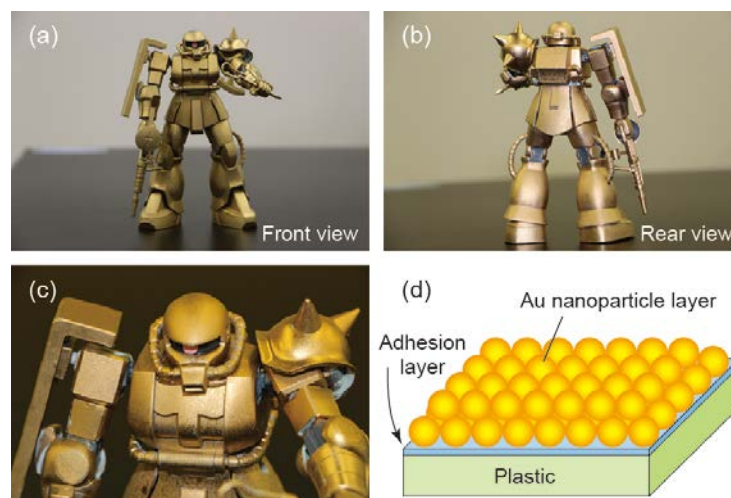


Fig. 1. A plastic model painted in the gold nanoparticles. Front view (a) and rear view (b) of the plastic model. (c) A magnified image of the plastic model. (d) Schematic illustration of the plastic surface modified with gold nanoparticles.