

A novel polymer semiconductor processing technology toward highly cost effective, environment -friendly and ultra -uniform large areal transistor arrays

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Brand -new copolymer (PDPPBTTSVS) exhibited unprecedented high mobility up to 3 cm²/Vs in optimal state. We developed a novel, cost -effective semiconductor deposition technique which can be characterized as environmental benign process enabled by molecular engineering, reducing the consumption of expensive solute enabled by vertical phase separation and minimizing the amount of solution enabled by our method. Based on non -chlorinated solvents, we developed optimal thin film deposition method using blend solution consisting of highly conductive PDPPBTTSVS and inert Poly - MethylStyrene. Furthermore, by applying our method, we could fabricate ultra -uniform 4 inch semiconductor film only with 40 μg of PDPPBTTSVS, which is almost three orders of magnitude lower than that required for conventional spin -coating method. The resulting transistor array deposited onto 4 inch wafer revealed excellent performances with extremely narrow spatial distribution and near -zero threshold voltage.