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Fabrication of Carbon nanotube TFTs for pressure-sensing device by printing method HIROYUKI ENDOH, NEC Corporation, FUMIYUKI NIHEY, HIDEAKI NUMATA, KAZUKI IHARA, Technology Research Association for Single Wall Carbon Nanotubes, TSUYOSHI SEKITANI, TAKAO SOMEYA, The University of Tokyo
— Printing technology is very promising from many advantages, for example, low cost, flexible etc. We previously have developed a high-performance printed thin-film transistor(TFT) using single-walled carbon nanotube(CNT). A simple ink-jet printing system was used for drawing the device patterns. The maximum temperature was 200 degrees during nano-silver electrode fabrication. The temperature of CNT-channel patterning is under 50 degrees. The widths of the source and drain electrodes were about 1 mm and the channel length were about 150 μm. The thickness of the gate insulator was about 650 nm. The estimated mobilities using over 95% purified semiconductive-CNT were $\sim$5.1 cm2/Vs for the TFTs whose on/off ratio were more than 5,000. This time we fabricated CNT-TFT arrays for pressure-sensing sheet devices, using the printed-process on a plastic film. CNT-TFT sheet has a dimension of 16 x 16 TFTs. The average mobility of the TFTs is 4.6 cm2/Vs. The pressure-sensing cell was prepared to combine Printed-TFT, a conductive rubber sheet and a film with a copper foil. Drain current changes in response to pressure applied to the current changes were observed up to 100nA from 10pA. These results were very promising for CNT-TFT applications to printable electronics.

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