

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Wide dynamic range stretchable electrical interconnect using carbon nanotube sheets and elastomer¹ YOURACK LEE, VIET THONG LE, YOUNG HEE LEE, DONGSEOK SUH, Center for Integrated Nanostructure Physics, Institute for Basic Science, Department of Energy Science, Sungkyunkwan Univ. — Stretchable electric conductor has been investigated for bendable electronics and wearable devices. Nanoscale conducting materials such as silver nanowires, gold nanoparticles, graphenes, and carbon nanotubes had been employed for stretchable conductor. Various structural designs like wrinkle, coil and even fabric had been adopted to reduce a direct stress applied to conducting materials for structural stability. Once such conducting materials are stretched, however, their resistance increased enormously because of the dimensional change related to Poisson ratio and the percolation based electrical conduction. In this study, we fabricated a stretchable conductor by combining carbon nanotube sheets and highly stretchable elastomer, which only has 10% of resistance change while it is stretched up to 600% strain. And we found out that the resistance change can be decreased less than 1%, even though it is stretched up to 600% strain, by using a proper capping method that prevents the contacts between folded regions of conducting materials. We expect that this method can help the practical usage of this stretchable conductor as a stretchable electrical interconnect applications.

¹This work was supported by the Institute for Basic Science (IBS-R011-D1) and the Basic Science Research Program through the NRF of Korea, funded by the Ministry of Science, ICT & Future Planning (No. 2013R1A1A1076063).

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Date submitted: 14 Nov 2014

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