The alignment of silver nanowires under the influence of surfactant

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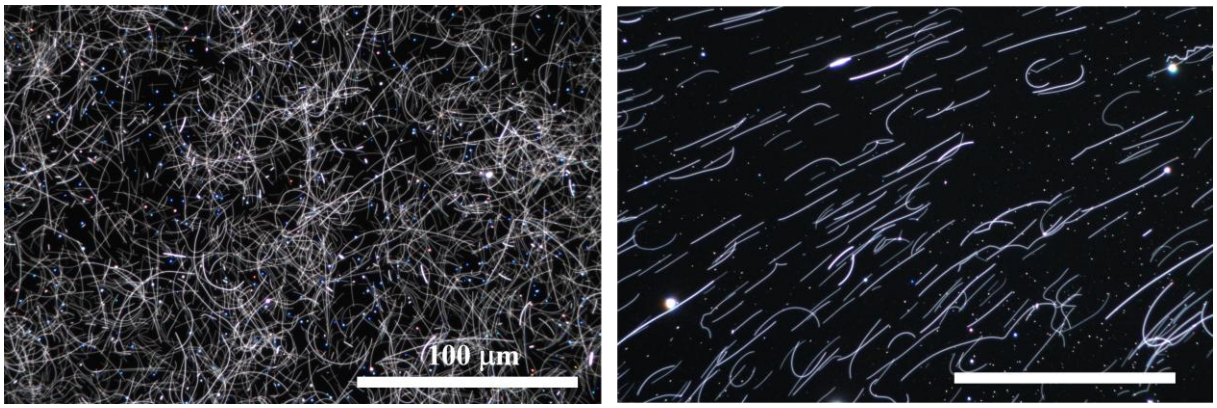
Silver nanowires are conventional material to make a thin sheet of conducting layer. There are many ways to process the nanowires, but the coat-and-dry method is perhaps the most common technique. However, the evaporation of complex fluid usually accompanies the emergence of strong internal flow effect, which sometimes changes the deposition pattern.

In this study, we report the spontaneous patterning of silver nanowires when a small amount of surfactant is added to the solution of silver nanowires. Using nanowires of diameter 200 nm and length 2000 nm, we make aquatic solution and added sodium dodecyl sulfate. We simply coat a glass substrate with the solution, and we let it dry by heating the substrate at 150 degree Celcius for 15 minutes. Our visual inspection shows that the pattern of nanowires after the solution is fully evaporated is influenced by the concentration of sodium dodecyl sulfate. When the surfactant concentration is below a certain value, nanowires form a random and isotropic pattern. However, when the concentration is above the certain value, nanowires starts to align in a single direction.

This work is supported by National Research Foundation of Korea (NRF) grant, funded by the Ministry of Science, ICT and Future Planning (No. 2021R1C1C1010158).



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