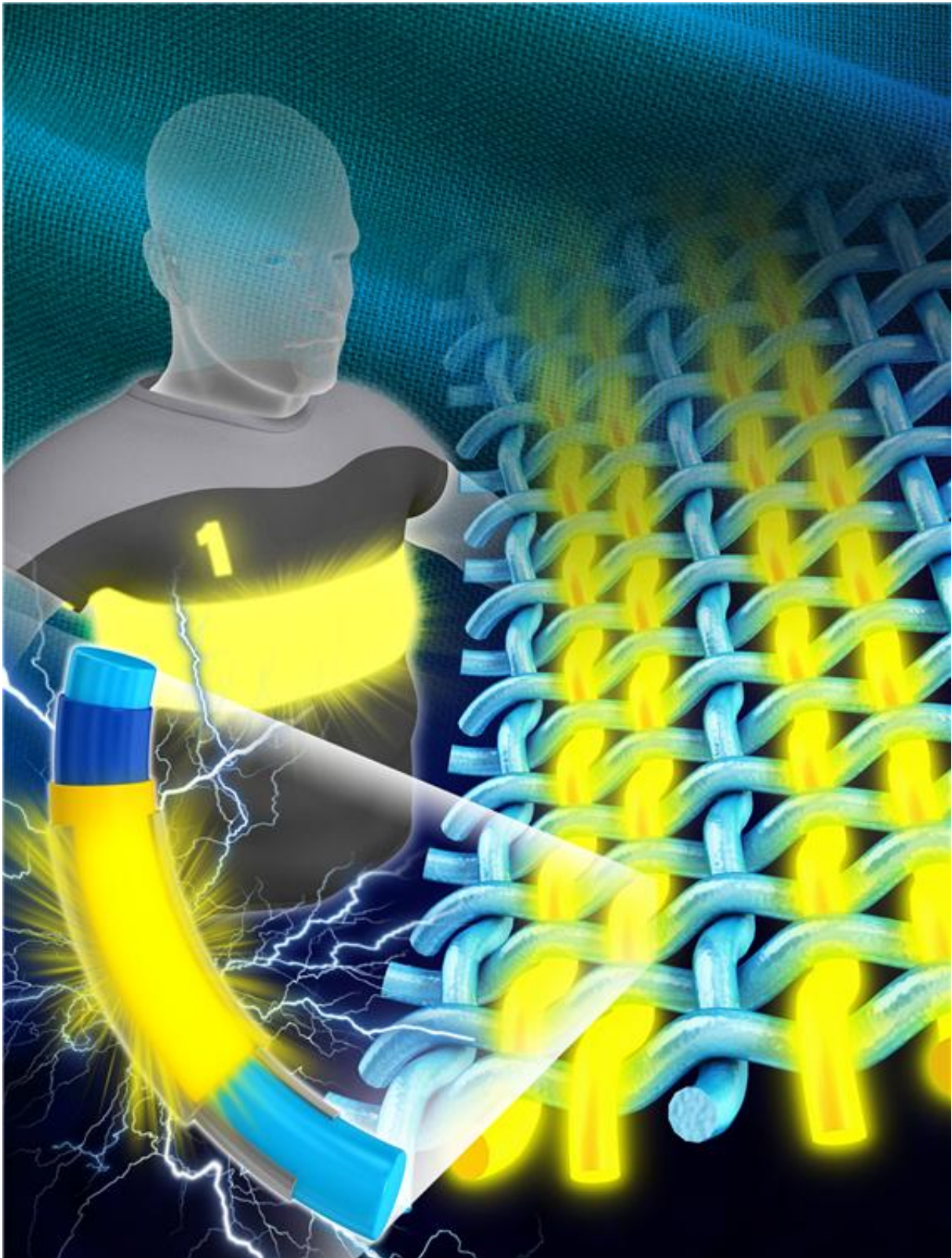


Fiber-like light emitting diodes for wearable displays

August 12 2015



The next generation wearable display using fiber based light emitting diodes.

Credit: KAIST

A research team at Korea Advanced Institute of Science and Technology (KAIST) has developed fiber-like light emitting diodes, applicable to wearable displays.

Professor Kyung-Cheol Choi and his research team from the School of Electrical Engineering at KAIST have developed fiber-like light emitting diodes, which can be applied in wearable displays. The research findings were published online in the July 14th issue of Advanced Electronic Materials.

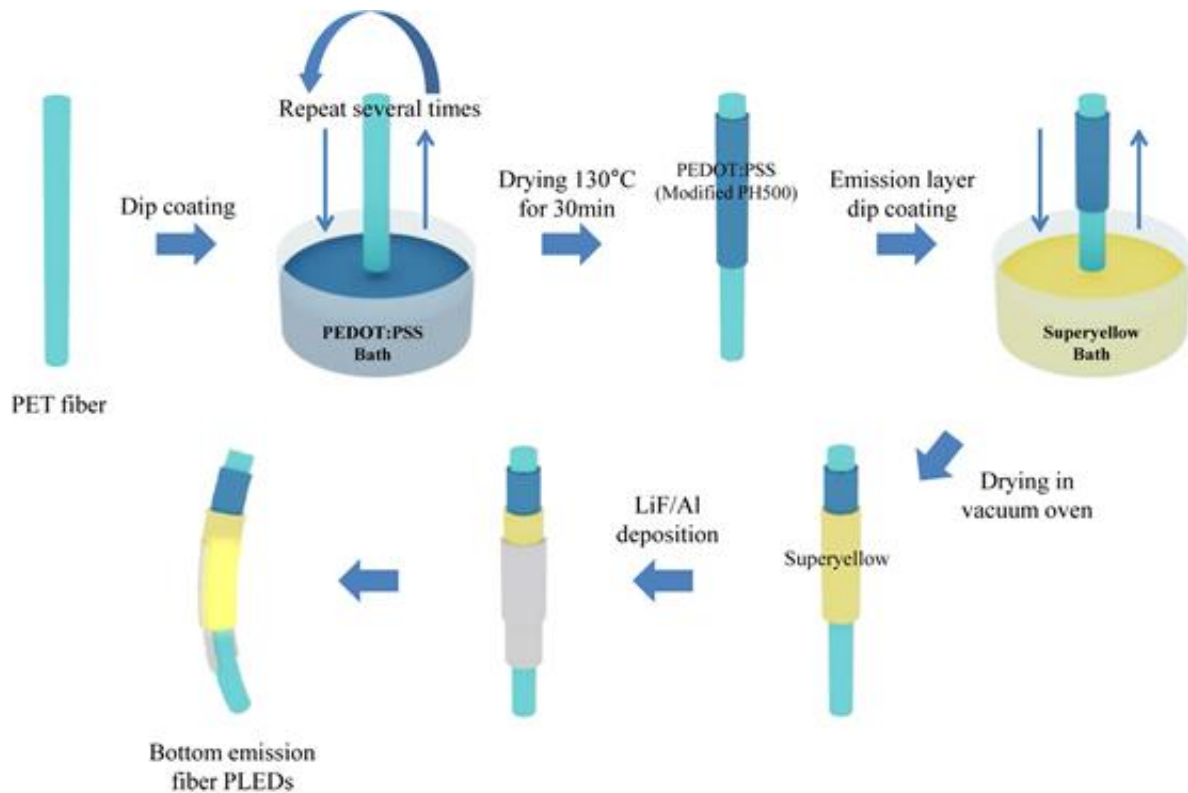
Traditional wearable displays were manufactured on a hard substrate, which is later attached to the surface of clothes. Such technique has posed limitations in applying it for wearable displays because inflexible displays were not adequate in practice, and the characteristics of fabric were ignored.

For a solution, the research team discarded the tradition of creating light emitting displays on a plane board. Instead, they focused on fibers, a component of fabrics, and developed a fiber-like [light emitting diode](#) that has the characteristics of both fabrics and displays.

The essence of this [technology](#), the dip [coating process](#), is to immerse and extract a three dimensional (3-D) board that looks like a thread in a solution. Then, the regular levels of organic materials are formed as films on the board.

The dip coating process allowed the layers of organic materials to be easily created on boards with a 3-D structure including a cylinder, which had been difficult in existing processes such as heat coating process. The

coating thickness can also be adjustable to hundreds of thousands of nanometers through the control of withdrawal rate.



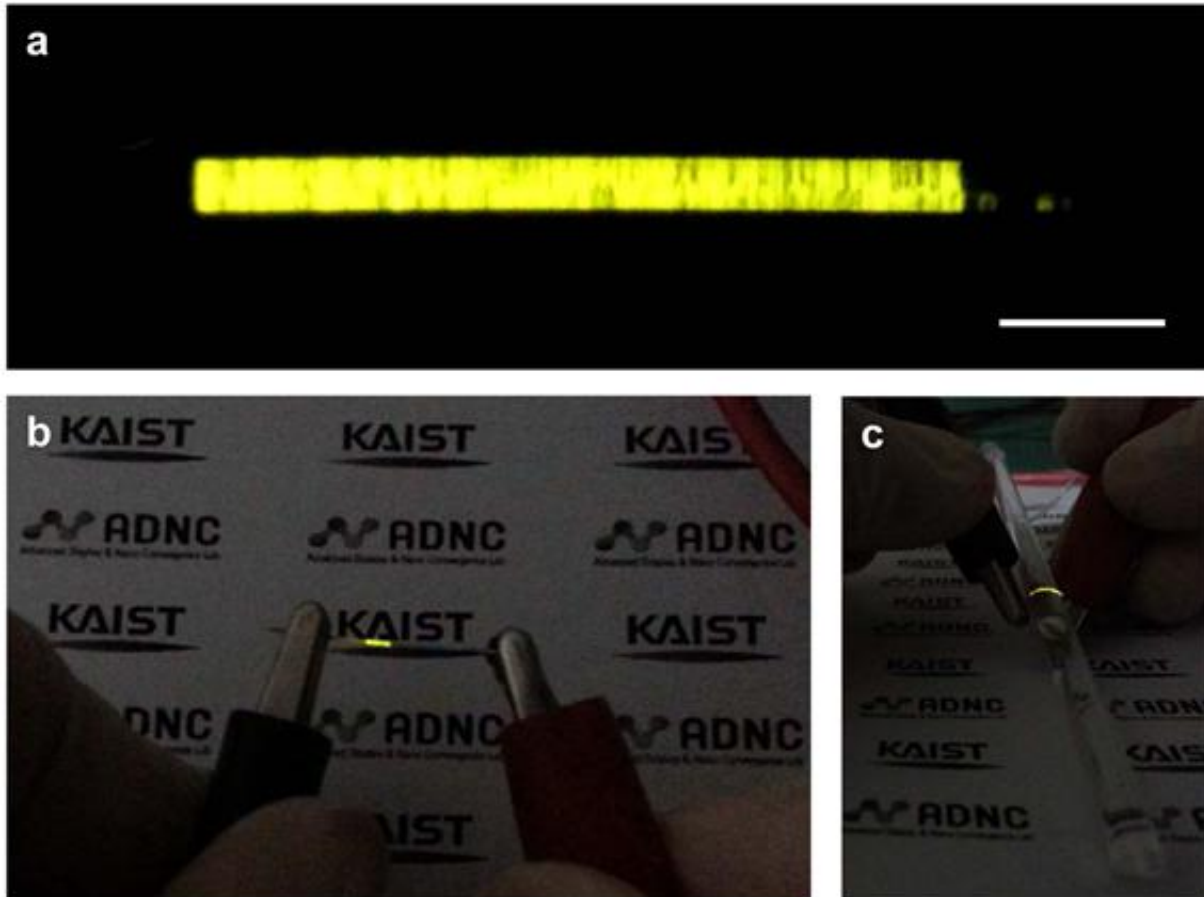
Dip coating process to create fiber based light emitting diodes. Credit: KAIST

The researchers said that this technology would accelerate the commercialization of fiber based wearable displays since it offers low-cost, mass production using roll-to-roll processing, a technology applied to create electronic devices on a roll of flexible plastics or metal foils.

Professor Choi said, "Our research will become a core technology in developing light emitting diodes on fibers, which are fundamental elements of fabrics. Hopefully, we can lower the barrier of wearable

displays to enter the market."

The first author of the published paper, Seon-II Kwon, added, "This technology will eventually allow the production of wearable displays to be as easily as making clothes."



Fiber Based Light Emitting Diodes. Credit: KAIST

Provided by The Korea Advanced Institute of Science and Technology

(KAIST)

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