National Research Foundation of Korea

NRF PR Team	Han-ki Kim Department Head (+82) 42-869-6116	Hyo-jung Jang Administrator (+82) 42-869-6116
Contact Person for this Article	Professor Myung-Han Yoon School of Materials Science and Engineering (+82) 62-715-2320	
Release Date	2018.11.26	

Professor Myung-Han Yoon's joint research team has developed a microfiber as a wearable perspiration sensor (National Research Foundation of Korea)

□ A wearable sweat sensor, which looks like a piece of fiber, has been developed to measure the dehydration in real time. A joint research team comprised of GIST (President Seung Hyeon Moon) Professor Myung-Han Yoon and Kyonggi University Professor Sang-hyun Joo has developed a wearable perspiration sensor based on a single strand polymer fiber that conducts electricity.

□ The wearable sweat sensor, which measures the concentration of ions in sweat in real time, is receiving more attention as the number of days of summer heat waves and heat-related illnesses has surged. Particularly, elderly people, children, and outdoor workers are susceptible to dehydration.

◦ The semiconductor devices in existing sensors are thin films that lack flexibility such as elongation. In addition, the performance and the accuracy were low, which made commercialization difficult.

□ The research team developed a one-dimensional fiber strand transistor from a two-dimensional thin film. From this, the researchers produced a perspiration sensor that maximizes usability. Productivity has also been improved by a simple production method of inserting a single sensor in the fabric. Due to the characteristics of the polymer materials used, it can be used in water for a long period of time and has high biocompatibility.

□ Particularly, the developed sensor showed high reproducibility and accuracy of over 95%. This is due to the application of a technique that accurately measures ion concentration irrespective of semiconductor specifications. In this method, the ratio of the change in ion concentration is proportional to the change * in measured current.

> * Change ratio of measured current: The rate of change between the measured current value in the solution to be measured and the current value at the reference concentration, thereby canceling all elements affected by the semiconductor.

□ Professor Myung-Han Yoon said, "We have presented a new paradigm that extends the applicability of water-based conductive polymers from existing 2D membrane devices to single-fiber devices. In the near future, I expect the emergence of new fiber-based bioelectronics."

□ This research was supported by the National Research Foundation of Korea and was published in *NPG Asia Materials* on November 26, 2018.

⌘