

Skin-Mounted Sweat Sensor

An accurate, inexpensive, and user-friendly colorimetric dermal patch uses sweat measurement to precisely monitor human hydration levels.

The state of hydration in humans is a delicate physiological parameter with direct effects on body function at the cellular, organic, and systemic levels. Studies have shown that deviations as small as 2 percent lower than normal can reduce cognitive and physical performance by more than 30 percent. Unfortunately, monitoring and maintaining hydration can be difficult. Methods of analyzing these levels vary between serum ion concentration, urine color, and body mass. Body mass and urine analysis are the more conventional techniques, but lack accuracy due to measurement shortcomings.

Researchers at Purdue University have developed a colorimetric dermal patch that measures human hydration by collecting and measuring sweat secretion over small areas of skin. Since most water loss in humans occurs via sweat, this method provides the most accurate analysis of hydration. The device consists of an inexpensive, laser-patterned filter paper sandwiched between two medical grade films, OpSite*. The filter paper contains a water-activated dye that provides an identifiable color change depending on moisture loss from small areas of skin. It is user friendly and easily identifies levels of moisture loss.

Advantages:

- Accurate
- Inexpensive
- User friendly

Potential Applications:

- Medical/Health
- Athletics
- Cosmetics

Technology ID

2016-ZIAI-67583

Category

Materials Science &
Nanotechnology/Advanced
Functional Materials

Authors

Vaibhav Jain
Manuel Ochoa
Babak Ziaie

Further information

Dipak Narula
dnarula@prf.org

View online



-Military

TRL: 4

Intellectual Property:

Provisional-Patent, 2016-10-02, United States | Utility Patent, 2017-10-02,
United States | CON-Gov. Funding, 2020-08-10, United States

Keywords: colorimetric dermal patch, hydration monitoring, sweat secretion measurement, wearable hydration sensor, non-invasive hydration analysis, filter paper sensor, water-activated dye, physiological parameter monitoring, moisture loss indicator, athletic performance monitoring, Biomedical Engineering, Biosensors, Dermal Patch, Hydration, Medical Devices, Medical/Health, Sensors