

Making a lab that fits in your pocket

Today at an event in London, BASF presents Hertzstück™, a groundbreaking infrared detector which may soon transform smartphones into portable laboratories that fit in a pocket. The shown prototype of a miniature spectrometer will, for example, enable consumers to measure the fat content of curd cheese, as the infographic shows. This innovative near infrared (NIR) sensor for wavelengths of 1-3 µm was developed by the startup trinamiX, a company founded by BASF researchers in Ludwigshafen in 2015. The patented thin film encapsulation of the functional semiconductor layer is very stable and protects the sensor from environmental influences such as water and oxygen. This miniaturization means that Hertzstück™ can soon be installed as a sensor chip on the circuit board of a smartphone.

In near-infrared spectroscopy, short-wave infrared light is emitted to cause specific molecular vibrations which can then be detected by the sensor. In industrial processes, this is routinely carried out using large equipment, for example, for quality controls of food and pharmaceutical products. Specialized analysis software can then be used to measure aspects such as water content or the content of proteins and fats.

Installed in a smartphone, this measurement technology will one day also provide useful information to consumers about the invisible properties of their food. This can be helpful for people who want, for example, to monitor fat consumption or eat a vegan diet.

Analyzing food with a smartphone happens in just a few seconds, without compromising the product in any way. In certain cases, the near infrared sensor can even be used to measure through packaging, but the application is especially useful for unpackaged and prepared foods. And there are many other potential non-food applications for the Hertzstück™ detector, including measuring the moisture content of skin to select the right cosmetic products, the level of active ingredients in medications or even the content of natural fibers in furniture materials. The first spectrometers using the new infrared sensor will be available in 2019 for industrial and semi-professional applications. The average consumer will likely have access to near infrared spectroscopy in their smartphone from 2022.

How to analyze food with your smartphone using the infrared detector Hertzstück™

