Screening device turning a smartphone camera in a digital readout

Use the camera of a smartphone to quantify the quality of water, food and wine samples using paper strip-embedded graphene quantum dots

This fancy and feasible device developed by ICN2 researchers is able to measure the quality of wine samples and detects the presence of some pesticides in water and/or food samples in a very fast way. The quenching capabilities of Graphene quantum dots photoluminescence are exploited in a fashion and simple way with the aid of a mobile phone camera.

This eco-friendly technology offers numerous possibilities for versatile applications. It is of special interest in remote settings where sophisticated instrumentation is not available.

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GRAPHENE FLAGSHIP

BENEFITS

- ✔ Green technology
- ✔ Simple
- ✔ Easy to use
- ✔ Based on widely used image technologies

The device can be used as a screening tool to measure the quality of wine and to detect phenols and polyphenols in environmental and food samples. It opens new opportunities up for a rapid and simple screening of organic compounds directly in the field.

The use of graphene in this context simplifies the current detection techniques by requiring no sophisticated equipment. In addition, graphene quantum dots are eco-friendly materials with high luminosity. All together makes it an excellent candidate to replace the former and harmful quantum dots made of metals.

Why graphene?

The device uses an ultraviolet-LED to excite the quantum dots allowing the emission of blue light. The measurement and detection are based on the photoluminescence quenching of graphene quantum dots when they get in contact with certain type of polyphenols compounds.

Three simple steps

1. Open and configure the smartphone camera (ISO 100 shutter speed 1/125 approx.).
2. Take a picture of the control blue spot containing only Graphene quantum dots (control) and take another picture of the spots containing the samples.
3. The decrease in the intensity of the blue light of the user samples indicates the detection of certain polyphenols. Additional software allows precise quantitative results.

This application is patent pending.