Sensors for the detection of GHB in beverages

DESCRIPTION OF THE TECHNOLOGY

Hydroxybutyric acid (GHB) is one of the drugs used in chemical submission. It is an odourless, colourless, slightly salty compound that is sometimes used recreationally. However, this compound, given without the victim's knowledge, has been used on numerous occasions for the purpose of committing a crime, often a sexual assault, as it overrides the victim's will. It remains in the body for 3 to 6 hours and its metabolites are excreted quickly, so it is very difficult to detect its presence after the aggression.

Until now, the techniques with colorimetric sensors to detect GHB in beverages described in the literature had several drawbacks, mainly that the test shows false negative responses with some beverages.

Researchers from the MODeLiC group at the University of Valencia have developed chemosensors to detect GHB in alcoholic beverages, soft drinks and combinations of both. These types of sensors are excellent alternatives to classical analytical detection methods due to their chemical simplicity, their ease of use and their adequate and rapid response in real time and in-situ.

In the presence of GHB, the compounds developed react positively with GHB, resulting in a colour change (from pale yellow to orange or red depending on the sensor used) or a pronounced increase in fluorescence emission.

From the compounds, a reliable and easy-to-use kit is obtained that allows a visual determination of whether a beverage, whether alcoholic, non-alcoholic or mixed, has been contaminated with GHB prior to ingestion. The kit consists of two small, transparent, open and closeable tubes plus a pair of droppers. In addition, the kit is accompanied by the corresponding instructions as well as a colour scale for visual readability.

MARKET APPLICATION SECTORS

The main application of the technology is in health and safety sector.

TECHNICAL ADVANTAGES AND BUSINESS BENEFITS

The main advantages provided by the invention are:

- The set-up kit requires only one drop of the beverage to perform the analysis.
- It is easy to carry and use. In addition, it is sure and discret.
- It has a high sensitivity.
- The device is environmentally friendly as it is made of low polluting compounds and materials.

CURRENT STATE OF DEVELOPMENT

The technology has been validated in real environments (TRL 6-7)

INTELLECTUAL PROPERTY RIGHTS

The technology is protected through the patent application P202030840, entitled "New benzoxazole-derived compounds, how to obtain them and their use in the detection of GHB in beverages" with priority date 06/08/2020, and through the patent application P202030841 entitled " New thiourea-based compounds, how to obtain them and their use in the detection of GHB in beverages " with priority date 06/08/2020.

COLABORATION SOUGHT

- License agreement for use and exploitation.
- Subcontracting agreement with another company.
- R&D project to advance development.

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RELATED IMAGES

Figure 1: Changes in sensors in the presence of GHB

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