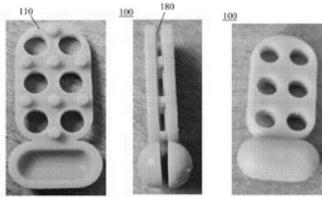


DESCRIPTION

Devices and methods for use in extraction procedures of analytes (organic and inorganic, including heavy metals) from matrices (e.g., complex matrices) in various fields (e.g., biological, clinical, chemical, environmental, toxicological, and forensic) are provided. The device can comprise a support structure acting as a rigid and stable support for extraction materials that can be inserted therein. The device can comprise a plurality of windows in the support structure through which the extraction materials can be exposed. The device can include two portions that can join together (e.g., using an interlocking system). The major advantage of this device is that the number of positions or "windows" can also be increased (obviously by increasing the size of the device) in order to further broaden the spectrum of the analytes of interest (especially in the case of qualitative-quantitative analysis in where it is possible to have a greater quantity of sample - e.g. environmental and/or biological fluids such as urine - or a screening analysis is necessary). Extraction procedures of analytes (organic and inorganic, including heavy metals) from matrices (e.g., complex matrices) in various fields (e.g., biological, clinical, chemical, environmental, toxicological, and forensic). The device act as a rigid and stable support for extraction materials (e.g., membranes, electro-spun materials, membranes and materials obtained from adsorbent systems recovered from production and/or use waste, films, viscous gels, particles packed into hard disks, molecularly imprinted polymers (MIPs), paper, recycled planar adsorptive material, etc.) that can be inserted therein.



ADVANTAGES

- Improved enrichment factor during the analyte/s extraction from complex matrices (biological, environmental, etc.);
- Allows you to use any permeable membrane-based planar extraction material;
- The configuration allows the successful use of electrospun membranes and materials and materials obtained from adsorbent systems recovered from both production and usage waste;
- The 6 "window" configuration allows you to use up to 6 different membranes with different surface chemistry (in order to maximize recovery efficiency across a large panel of analytes with different chemical properties) and maximize method selectivity;
- The 6 positions allow you to use molecularly imprinted polymer (MIP) permeable planar extraction material in a planar configuration;
- The number of "windows" can be reduced in order to further reduce the size of the device to 2, 3, 4 or 5 positions based on the specific analysis needs;
- The use of the magnetic stirrer appropriately housed in the device allows you to control the rotation speed of the device inside the sample even in the case of field analysis using a battery-powered portable magnetic stirrer;
- Its small size makes it suitable for the analysis of even small samples (up to 4 mL in total).

APPLICATIONS

- Biological analysis
- Pharmacotoxicological analysis
- Clinical analysis
- Environmental analysis
- Pharmaceutical analysis
- Food and food supplements analyses
- Cosmetic analysis
- Quality control analysis

Legal status and application country :
US20240118179 A1
Application published-Pending

Priority number
2022US-18045640 2022-10-1

Commercial rights:
Exclusive rights

Applicants:
Florida international University
Università degli Studi
"G. d'Annunzio" Chieti-Pescara

Inventors:
Kabir Abuzar
Furton Kenneth G.
Locatelli Marcello
Tartaglia Angela

Technology sector:
Measurement

TRL:
6

 **Finanziato dall'Unione europea**
NextGenerationEU