

APPLICATION OF ON-LINE MULTIDIMENSIONAL HPLC+HRGC-MS SYSTEM TO FORENSIC TOXICOLOGY

Nieves Sarrión*, David Alonso*, Ariadna Galve*, José Antonio Muñoz*, Roger Gibert**, Josep M^a Gibert**

*KONIK-Tech S.A., Avda. Cerdanyola 73, Sant Cugat del Vallés. 08172 Barcelona, Spain.

**KONIK Instruments, 12221 SW 129th Ct. Miami – FL 33186, USA.

Forensic toxicology is the use of toxicology and other disciplines to aid medico legal investigation of death, poisoning and drug use. A toxicological analysis can be done to various kinds of samples, such as urine, blood, hair and oral fluids.

Prescribed and illicit drugs, pesticides, natural products, pollutants and industrial compounds are some of the most common compounds encountered. Screening methods include TLC, GC and immunoassay and confirmatory methods, such as GC-MS and LC-MS/MS are usually used. Most of such methods require sample preparation steps to extract the compounds of interest and/or to remove interferences, being LLE or SPE frequently used. LC is an alternative clean-up procedure to such traditional techniques and on-line HPLC+HRGC is becoming a more powerful tool for the trace analysis of complex matrices.

In this work, an evaluation of the automated on-line Multidimensional HPLC+HRGC-MS System (KONIK METABOLIZER) is presented for screening impurities of solid-dose drugs and determining their presence in biological samples. Certified biological samples containing drugs were injected into the HPLC system after hydrolysis if necessary. The target compounds were retained in the HPLC column (C4, C18...), while salts or other interferences were removed. Afterwards, target analytes, which were eluted in a compact fraction from the column with an appropriate solvent, were transferred thorough TOTAD[®] interface to the GC injector. Finally, an on-line automatised derivatization step was performed in the interface trap to derivatize the compounds before GC-MS determination. Quality parameters of the optimised methods such as linearity, precision and limits of detection are given.