

FORENSIC LITERATURE THESIS

LITERATURE THESIS

Title	: The use of GC-(FT)IR for the analysis of illicit drug isomers
Keywords	: illicit drugs, infrared spectroscopy, IR, FTIR, GC-IR, isomers, new psychoactive substances (NPS)
Forensic Expertise Area	: Forensic Chemistry – Illicit Drugs
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SHORT DESCRIPTION

Recent years have seen an explosive growth in designer drugs or so called New Psychoactive Substances (NPS) in the global illicit drugs market. NPS are often ordered over the Internet and are traded on an international scale. As soon as an NPS is detected and banned as an illicit substance new variants emerge that have not yet been listed. This rapid expansion of illicit substances provides new challenges for forensic laboratories involved in the chemical identification of drugs of abuse. The existence of active NPS isomers can lead to (near) identical Electron Impact Mass Spectra (EI-MS) which can hamper an unequivocal identification. This is especially true for aromatic ring substituted isomers. Gas chromatography in combination with Infrared detection (GC-IR, GC-FTIR) in addition to GC-MS is a promising approach to obtain sufficient structural information to confidently detect and identify drug isomers. In this literature thesis an overview is given on the use of GC-IR/GC-FTIR for the analysis of illicit drugs including NPS. The application of GC-IR (with gas phase IR spectroscopy) is compared to use of solid state IR for the characterization of illicit drugs.

REFERENCES

- 1) Isomeric Fluoro-methoxy-phenylalkylamines: a new series of controlled-substance analogues (designer drugs), Rösner, Peter ; Quednow, Bernd ; Girreser, Ulrich ; Junge, Thomas, *Forensic Science International*, 2005, Vol.148(2), pp.143-15.
- 2) Analysis of six 'neuro-enhancing' phenidate analogs, Klare, Helge ; Neudörfl, Jörg M. ; Brandt, Simon D. ; Mischler, Elisabeth ; Meier-Giebing, Sigrid ; Deluweit, Kathrin ; Westphal, Folker ; Laussmann, Tim, *Drug Testing and Analysis*, March 2017, Vol.9(3), pp.423-435

REQUIRED/RECOMMENDED EXPERTISE

Basic understanding in forensic chemistry. Affinity with illicit drugs analysis and (FT) infrared spectroscopy is recommended.

