

Poster Presentation

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Complex Analysis of Counterfeits and New Synthetic Drugs in Forensic Practice

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Counterfeit drugs began to appear on the world market in 90-ies of the 20th century and their number is significantly increasing. It applies not only to dietary (food) supplements, but also for vitally important preparations. The definition of a counterfeit is not entirely uniform, some drugs can be determined in some countries as counterfeits but not in other countries. World Health Organization defines counterfeits as medicines (drugs) "which are deliberately fraudulently mislabelled with respect to identity and/or sources". IFPMA (International Federation of Pharmaceutical Manufacturers Associations) states that 7% of all medicines (drugs, pharmaceuticals) sold around the world are counterfeits and estimates that the value of the trade in counterfeit products is more than USD 30 billion. Forensic analysis deals with these materials comprehensively, besides standard quantitative analysis of content components, examined the shape and form of tablets and logo embossing, measured quantitatively colour, characterized surface, etc. Content substances, in addition to (apart from) techniques of organic analysis, are tested also by methods of X-ray powder diffraction. The advantage is the possibility of non-destructive analysis of tablets directly in the blister and complex analyses of organic and inorganic phases. Automated divergence slits and collimators are use to on a primary x-ray beam. Methods of image analysis are employed for correct adjustment of surface analysed. Phase analysis is carried out using both commercially available databases and as well data of own standards. So-called "Legal Highs" - new synthetic drugs emerging on the world market pose a similarly relevant problem. These are structural variants of known substances with psychomimetic effects, which are not included on the lists of controlled substances. An array of these substances are legally sold not only on the internet, but also in newly established stores called Amsterdam Shops or Smart Shops. Analysis, identification and quantification of these substances are rather complex as they are not included in identification databases. The methods of x-ray diffraction are very suitable complementary techniques to common methods of organic analysis - GC-MS, MS/MS, MSn, NMR, etc. The occurrence of "Legal Highs" on the market can be regarded as very dangerous also considering that toxicity in these substances has not been known so far.

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