

Chemical Fingerprinting of the Ephedrine Pathway to Methamphetamine

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Abstract : As pseudoephedrine, a common ingredient in cold and flu medications is closely monitored and restricted in Australia, alternative methods of accessing it are of interest. The impurities and by-products of every reaction step of pseudoephedrine/ephedrine and methamphetamine synthesis have been mapped in order to develop a chemical fingerprint based on synthetic route. Likewise, seized methamphetamine contains a combination of different cutting agents and starting materials. Therefore, in-silico optimised two-dimensional HPLC with DryLab® and OpenMS® software has been used to efficiently separate complex seizure samples. An excellent match between simulated and real separations was observed. Targeted separation of model compounds was completed with significantly reduced method development time. This study produced a two-dimensional separation regime that offers unprecedented separation power (separation space) while maintaining a rapid analysis time that is faster than those previously reported for gas chromatography, single dimension high performance liquid chromatography or capillary electrophoresis.

Keywords : chemical fingerprint, ephedrine, methamphetamine, two-dimensional HPLC

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