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Identification of Mephedrone Synthesis Reagents using CEMs

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Summary

One of the most commonly used synthetic cathinone is 4-methylmethcathinone (mephedrone, MEP) [1]. There are several synthesis pathways for mephedrone but the production of MEP from 4-methylpropiophenone (MPP) is most commonly used because this primary precursor is commercially available over the Internet, and the synthesis does not require complex and professional laboratory equipment. Interestingly, mephedrone could theoretically be used in the synthesis of pseudoephedrine (PEP) or ephedrine (EP), as it was speculated [2].

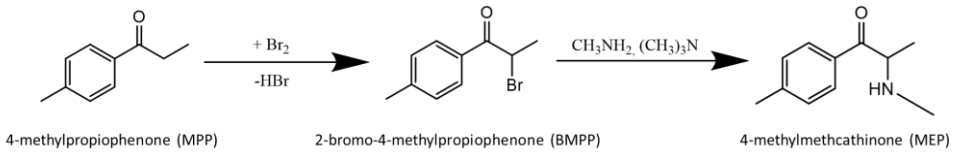

Fig. 1. Synthesis of mephedrone from commercially available substances.

This work aimed to develop an approach for the identification of these substances by combining two methodologies - CE-DAD and CE-C^4D. The analytes can be classified based on their chemical structure, with some being neutral (MPP and BMPP), while others have the potential to ionize in a solution (methylamine - MA, trimethylamine - TMA, EP, PEP, and MEP) or absorb radiation in the UV range (MPP, BMPP, MEP, EP, and PEP). To accommodate these differences, two distinct methods have been proposed. These include a portable capillary electrophoresis system with C^4D detection and a commercial, bench-top capillary electrophoresis system. The results demonstrated successful methods optimization, with peak resolution for EP, PEP, and MEP achieved under specific background electrolyte conditions (CE-C4D: BGE M; CE-DAD: BGE U). The method's repeatability was evaluated, and it showed satisfactory intra-day and inter-day precision for MEP, EP, and PEP for both methods combined into the efficient qualitative protocol for mephedone profiling.

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