

EC/LC/ICP-MS Analysis of Amiodarone and Its oxidation products

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The on-line combination of electrochemistry (EC), liquid chromatography (LC) and mass spectrometry (MS) allows to mimic the cytochrome P450 mediated oxidative metabolism of pharmaceuticals in the body.^[1] In a large volume electrochemical flow-through cell, the quantitative conversion of the target compounds under optimum conditions, drugs can be oxidized to their phase I metabolites. These metabolites can be separated under reversed-phase conditions and further characterized mass spectrometry.

The antiarrhythmic agent amiodarone was chosen as model compound for the evaluation of the EC-LC-MS system with both electrospray (ESI) and inductively coupled plasma (ICP) ionization because it contains iodine atoms. Amiodarone was oxidized at a porous glassy carbon working electrode at different electrochemical potentials under formation of mainly *N*-dealkylated species, which were also observed under cytochrome P450 catalysis. The oxidation products were separated under isocratic RP-HPLC conditions using phase optimized liquid chromatography^[2], because gradient elution leads to plasma instabilities. ESI-MS provided qualitative information on the oxidation products, while for the first time, ICP-MS was used for the quantification of the metabolites.

References

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- [2] Lamotte S., Brindler R., Bischoff K.D. CLB Chemie in Labor und Biotechnik 2006, 57(9-10), 349-351.