
STATE OF THE HYPHENATION

Peter Schoenmakers

University of Amsterdam, Faculty of Science, HIMS, 1018 WV Amsterdam, Nieuwe
Achtergracht 166, The Netherlands, p.j.schoenmakers@uva.nl

HTC-11 signals 20 years of conferences on Hyphenated Techniques for Chromatography and perhaps 40 years of scientific and technological explorations on the subject. Twenty years ago the HTC series was started mainly by people from industry and this is still evident today. The development of hyphenated systems was not just curiosity driven academic research. Somebody was waiting for whatever progress could be made – or many bodies, which is what spurred the initiation of the HTC conferences.

Twenty years on many hyphenated techniques are well developed. On the detection side, GC-MS and LC-MS are experiencing incremental technological progress, but an enormous increase in application. Before the column, many sample-preparation techniques can be applied on-line and GC×GC – and to a lesser extent LC×LC – are coming of age. All these techniques are extensively applied in industry.

Other potentially very rewarding hyphenated systems are less mature and there are still significant gaps in our technological abilities.

MS can be used for identification (mainly with GC) or confirmation purposes (GC or LC) and for the quantitative analysis of target compounds, for which suitable standards are available. Quantitation of large numbers of components in complex mixtures is a key issue for the future.

We are able to separate quite complex mixtures of volatile analytes (thousands of peaks) and moderately complex mixtures of non-volatile analytes (hundreds of peaks) in a single analysis and in a reasonable time. We still need ways to separate very complex mixtures of non-volatiles.

In this lecture we will reflect on the breathtaking progress in the field of hyphenated systems, as well as on some major challenges and possible ways to tackle these in the future.