

OP 5.2

Metallocenes as labels in Bioanalysis

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Organometallic compounds are not among those substances, which obviously are well suited as labels in bioanalysis. This is due to their limited stability in the presence of air and water and their limited stability in polar solvents. However, many ferrocene and cobaltocinium compounds are surprisingly stable over the complete analytical process and are soluble in polar organic solvents or even water, respectively. The most important advantage of the metallocenes is their established chemistry. A large variety of functional groups is readily accessible, including thiol reactive maleimides or amin-reactive succinimides.

We are presenting novel metallocene-based labelling strategies for the analysis of peptides and proteins. The derivatives are analyzed using liquid chromatography (LC) or capillary electrophoresis (CE) with electrospray (ESI) and inductively coupled plasma (ICP) mass spectrometry (MS) detection. While ESI-MS provides for molecular information, in particular when combined with tandem mass spectrometry experiments as neutral loss scan or precursor ion scan, ICP-MS allows the exact quantification of the metal ion. Even complex mixtures of a tryptic digest can be easily analysed. The combination of both techniques is a unique tool for protein analysis, as demonstrated in this presentation.