

3.2 Chromatography and Electrophoresis (P. Schulze)

The department of Chromatography and Electrophoresis provides analytical services for in-house scientists, e.g. qualitative and quantitative determinations, chiral analysis, preparative separation or purification of product mixtures and catalysts. For this purpose, modern chromatographic and electrophoretic separation methods as well as hyphenated techniques are applied. A section of the group is involved in development of detection technology.

Gas chromatography (U. Häusig)

Capillary GC is performed using commercial systems in diverse instrumental setups. In routine analysis most samples are analyzed using flame ionization or thermal conductivity detection, whereas unknown substances are identified using the hyphenation of gas chromatography and mass spectrometry (GC-MS). The team also develops new analytical methods, e.g. the direct analysis of small amounts of organic compounds in aqueous solution.

Liquid chromatography (A. Deege)

The LC laboratory applies a variety of (ultra) high-performance liquid chromatography techniques such as reversed / normal phase, ion exchange and size exclusion chromatography. Besides optical detection techniques, MS and electrochemical detection are utilized to detect substances lacking any UV active functional groups, e.g. cellulose decomposition products.

In addition to routine analysis and method optimization, the LC team develops column switching methods to enable sufficient separation efficiencies and to reduce analysis time of complex or crude samples. The application of capillary zone electrophoresis and micellar electrokinetic chromatography complement the tool box of liquid phase separations.

Separation of preparative sample amounts is also possible using preparative LC instruments. Usually, the purified substances are used as educts in synthesis or characterized using further analytical methods e.g. NMR or MS.

Independent research projects

- 1) Spectrophotometric determination of H_2O_2 in highly acidic, organoperoxide-containing media
- 2) Synthesis of amino-reactive fluorescence dyes designed for capillary isoelectric focusing

Co-workers

Georg Breitenbruch, Alfred Deege, Stefanie Dehn, Leonid Gitlin, Ulrich Häusig, Corinna Heidgen, Heike Hinrichs, Dina Klütt, Frank Kohler, Jutta Rosentreter, Sylvia Ruthe, Philipp Schulze, Marie Sophie Sterling, Maximilian Wasserloos

Publications resulting from this research area

- (1) Audisio, D.; Luparia, M.; Oliveira, M.T.; Klütt, D.; Maulide, N. *Angew. Chem., Int. Ed.* **2012**, 51, 7314-7317.
- (2) Schweitzer-Chaput, B.; Sud, A.; Pintér, Á.; Dehn, S.; Schulze, P.; Klussmann M. *Angew. Chem., Int. Ed.* **2013**, 52, 13228-13232.

Cooperations

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