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Inverse liquid chromatography in surface characteristic of materials

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Examination of the physicochemical properties of different materials is important for their adsorptive or adhesive characteristics. Inverse Liquid Chromatography (ILC) technique differs from among generally known chromatographic methods, that it is not related to the separation of components of mixtures, but the interaction of test compounds with the investigated material, constituting the stationary phase of chromatography column. Interactions between the material and the test compounds affect the measured retention parameters and the shape of chromatographic peaks. Application of ILC seems to be useful to direct study of solid-liquid interactions in real conditions, which include: pressure, temperature and pH. This technique, in conjunction with proper mathematical models, allows evaluating the physicochemical characteristic of the biomaterials surface: its ability to various types of intermolecular interactions (e.g. capacity to donor-acceptor interactions), assessment of the impact of the number and type of functional groups on the surface activity. ILC can be also applied to characterize materials used in a separation process - mesoporous aluminosilicates (zeolites) for e.g. their ability to adsorption. The characteristic of the surface layer of such materials allows the analysis of the influence of the respective modifier's ligand for adsorption or separation processes. ILC technique thus allows the detailed characterization of the surface, taking into account its ability to various types of intermolecular interactions. This knowledge is essential for an appropriate development and improvement of different solid materials.

Biography

Katarzyna Adamska graduated at Wroclaw University of Technology at Faculty of Chemistry in 1999. In 2002, she started PhD studies at Poznan University of Technology in Institute of Chemical Technology and Engineering. In 2007, she got the academic degree of Doctor. Her PhD thesis entitled "Determination of the solubility parameter and its components for materials used in the pharmaceutical industry" was related, mainly, to the use of inverse gas chromatography in studies of different excipients, applied in pharmaceutical formulations.

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