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Separation of drug active ingredients by using subcritical water chromatography

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Drug active ingredients contain one or more chemical substances that cause physiological changes *in vivo* and substances that are responsible for the beneficial health effects experienced by patients. Drugs are usually grouped according to their physiological effects and antidepressants are one of the most frequently used of this group. In this study, fluoxetine and sertraline are used as selected model molecules obtained from antidepressant active agent, which have environmental as well as pharmacological and biological importance. For this purpose, naphthylamine attached poly (HEMA-MAH)(PHEMAH) (poly(hydroxyethyl methacrylate-N-methacryloyl-(L-histidine)-methylester) microspheres, which have different particle sizes will be synthesized and used as the column filling material (stationary phase) in high temperature liquid chromatography which is one of the green chromatography techniques and determination of the method development and optimization conditions for the synthesized column filler will be conducted by using chemometrics application of response surface methodology. Many analytical methods such as High Performance Liquid Chromatography, Liquid Chromatography-Mass Spectrometry/ Mass Spectrometry, Gas Chromatography-Mass Spectrometry are used in literature for the chromatographic separation of the active ingredients of antidepressants. Among the used techniques, the High Performance Liquid Chromatography (HPLC) shows the most effective separation technique. While RPLC (Reversed Phase Liquid Chromatography) is a popular analytical technique used today, organic solvents are required in traditional RPLC and an enormous amount of organic solvent is consumed worldwide for just chromatographic separation. The organic solvents used in HPLC are very hazardous and dangerous for environmental and human health, as well as expensive in term of both purchasing and waste disposal costs. Industrial wastewater pollution is being one of the major and perhaps most importantly problem resulting from uncontrolled technology in developing countries. Therefore, separation, purification and determination methods are more important and "nature-friendly" products and dissemination of related researchers is of great importance for use as solid/solid phase of determination methods due to environmental concerns. High temperature liquid water chromatography technique used the minimum level of organic solvent in which worldwide attention has been obtained recently. At the same time, in order to be successful in the separation process in HTLC, new generation of stable and resistant filler column is synthesized and is also an important application which is successful at elevated temperature conditions. The systematic studies are rapid, accurate, is expected to reach accurate and reliable results as the requirement of a scientific research.

Biography

Berkant Kayan is an Associate Professor of Chemistry, Aksaray University, Aksaray, Turkey. He has joined Aksaray University in 2009 as Assistant Professor and then quickly promoted to the Associate Professor position in 2012. He has 18 publications and research grants and projects from Scientific and Technological Research Council of Turkey - TUBITAK, Aksaray University-ASU-BAP-2012-9, and Mersin University- MERSIN-BAP. He joined the Department of Chemistry at East Carolina University in 2005 as visiting doctoral student for four months which was supported by Mersin University. He visited Technological and Educational Institute of Crete, Chania, Crete, Greece (2013) and Université Paris-Est Marne-la-Vallée., Paris, France (2015) with European Erasmus Bilateral as Guest Academic Researcher.

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