

## Usage of high temperature liquid chromatography in pharmaceutical applications



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### Abstract

Green chemistry', 'benign chemistry', 'clean chemistry', etc., are all terms used to describe approaches that consumption of reagents and energy, minimize the use of feedstock, as well as generation of wastes in the chemical industry. There are several approaches to achieve this goal such as using environmentally benign solvents and reagents, reducing the chromatographic separation times. High-temperature liquid chromatography (HTLC) is one of these techniques. This technique deals with liquid chromatography separations performed at temperatures typically within a range from 40°C to 200°C using organic solvent-water mixtures as the mobile phase. Working at high temperature is a promising approach to increase the analysis speed. Increasing the temperature leads to an increase in the mobile phase linear velocity. At the maximum operating pressure, the main benefit of an increase in the temperature is a reduction in the analysis time. In addition to decreasing the analysis time, reduction in mobile phase consumption could also be achieved leading to greener analysis. Traditional methods used for the analysis of pharmaceutically active compounds require large volumes of organic solvents and generate large amounts of waste. Also, the organic solvents used in analysis are very hazardous and dangerous for environmental and human health. With the awareness about the environment, the development of green technologies has been receiving increasing attention aiming at eliminating or reducing the amount of organic solvents consumed without loss in chromatographic performance. HTLC technique used the minimum level of organic solvent in which worldwide attention has been obtained recently.

### Biography:

Berkant KAYAN is a Professor of Chemistry, Aksaray University in Aksaray, Turkey. He joined Aksaray University in 2009 as Assistant Professor and then was quickly promoted to the Associate Professor in 2012 and full professor in 2018, because of his publications (32), and Grants (Scientific and Technological Research council of Turkey - TUBITAK, Aksaray University-ASU-BAP-2012-9, and Mersin University – Mersin-BAP Research Projects). He joined the Department of Chemistry at East Carolina University in 2005 as visiting doctoral student for four months by the support from 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 BILETERAL as guest academic researcher.

### Speaker Publications:

- 1."Ultrasonic-assisted extraction of 10-deacetylbaconin III from *Taxus baccata* L.: optimization using response surface methodology", *Journal of the Iranian Chemical Society*/ 18 July 2020
- 2."Stability and Extraction of Vanillin and Coumarin under Subcritical Water Conditions", *Molecules Online*/Vol 25 issue 5
- 3."Fe-modified hydrochar from orange peel as adsorbent of food colorant Brilliant Black: process optimization and kinetic studies", *International journal of Environmental Science and Technology*/ 26 November 2019
- 4."Synthesis of pumice-TiO<sub>2</sub> nanoflakes for sonocatalytic degradation of famotidine", *Journal of Cleaner Production*/Volume 202, 20 November 2018, Pages 853-862
5. "Simultaneous determination of citalopram, paroxetine, fluoxetine, and sertraline by high-temperature liquid chromatography", *European Journal of Chemistry*/Vol 9 Issue 3

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