

North Jersey Chromatography Group Webinar

Green Chromatography

14th MARCH 2024
1:30 pm - 3:30 pm EST

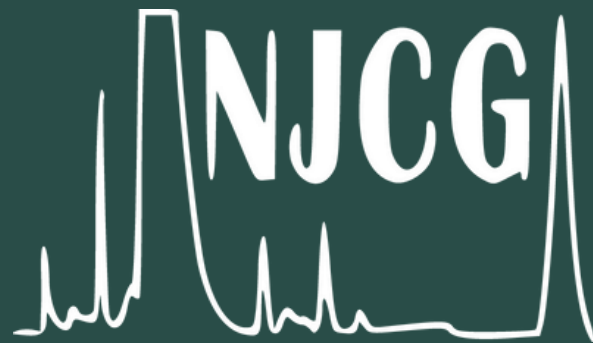


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Attaining sustainability with challenging separations in pharmaceutical methods development

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ABSTRACT

Pharmaceutical development currently relies on quality separation methods from early discovery through to line-of-site to manufacturing. There have been marketable and consistent innovations made regarding the column particle packing, ID, length, and connectivity, with more understanding of key parameters like void volume, flow rate, and temperature. All these parameters affect the resultant separation quality i.e., resolution, peak shape, peak width, run time, and signal to noise. There is however a strong need to consider method sustainability when developing reliable separation methods. The current shift toward UHPLC, the wider use of supercritical fluid chromatography (SFC) and a growing interest in miniaturization all reflect current trends toward chromatographic sustainability. Progress with methods applying the best method choices will consider newer instrument designs and newer column technologies over traditional, widely accepted separation methods. This presentation will discuss how chromatographers can develop a greater awareness of sustainable separation development using metrics like the analytical method greenness score (AMGS) for strategic advantages of making methods more efficient and more sustainable.

BIOGRAPHY

Dr. Michael Hicks has over 25 years of pharmaceutical research experience. He is currently Associate Principal Scientist in the Analytical R&D Department at Merck Research Labs in Rahway NJ. He specializes in separations, particularly for supercritical fluid chromatography as well as both small and large molecule separation and detection methods. He has 51 co-authored publications, over 1900 citations, 17 first author and is recently co-author of the text "Practical Applications of SFC for Pharmaceutical Research & Development" with Dr. Paul Ferguson (AstraZeneca).



Role of water and deep eutectic solvent additives in making SFC greener

Daipayan Roy
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ABSTRACT

SFC is typically considered as a greener technique compared to HPLC due to the use of supercritical carbon dioxide as the majority mobile phase. However, to increase the breadth of samples that could be possibly separated by SFC, organic modifiers are added (from 5-70%) to the carbon dioxide. Both in industry and academia SFC is majorly used for the separation of enantiomers. With environmental impacts of processes coming to the forefronts we are now faced with challenges to make further improvements to said processes. This talk will go into details regarding the addition of small quantities of water to SFC mobile phase. Effect of water, include not only increases in chromatographic figures of merit but also makes it greener by decreasing the amount of organic modifier required. The effects of water on different types of stationary phases with different surface chemistries will be discussed in order to further understand when water addition is suitable. Furthermore, the utility of a new class of additives- 'non-toxic deep eutectic solvents' as additive in SFC will also be discussed.

BIOGRAPHY

Daipayan Roy is currently a Senior Scientist at Amgen working in the Synthetics Separations group which provides analytical and purification support to early stage drug discovery. His work focuses on enantiomeric separations using supercritical fluid chromatography (SFC). He currently has 14 publications in various leading analytical chemistry journals. Prior to joining Amgen Dr. Roy received his PhD from University of Texas at Arlington in 2020 under the guidance of Dr. Daniel W. Armstrong where his work focused on chiral separations using macrocyclic glycopeptide stationary phases.