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Determination of additives, contaminants and byproducts in insulating liquids with desorption electrospray mass spectrometry

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There is a need for rapid determination of additives, contaminants and by-products in insulating liquids. Desorption electrospray ionization (DESI) has emerged as technique of choice for a variety of applications. Use of DESI for characterization and quantification of additives, contaminants and by-products in insulating liquids has been explored in our laboratory. Results obtained for selected target analytes were compared with the results obtained with the traditional methodologies based on high pressure liquid chromatography electrospray ionization mass spectrometry (HPLC-ESI MS), gas chromatography – mass spectrometry (GC-MS) and Fourier transform infrared (FTIR) spectrometry. Results showed that DESI offers a very rapid of quantitative determinations of selected analytes in complex matrices such as the insulating liquids. The most attractive feature of the technique is no or minimal sample pre-treatment thus permitting very rapid analysis. However, the precision obtained with the technique was found to be inferior to that obtained the other technique.

Biography

Shubhen Kapila is the MSMC Endowed Professor at the Missouri University of Science & Technology – a campus of the University of Missouri. He obtained his PhD in Chemistry from Dalhousie University, Nova Scotia, Canada and joined the University of Missouri System in 1977. He has published over 165 papers in reputed journals and has supervised research of more than 100 Graduate students and Post-doctoral fellows. He has been involved with national and international standardization bodies ASTM, ANSI and International Electrotechnical Commission (IEC), and has served as the convener of standard setting working groups and project teams.

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