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Green solvents selection for high voltage electrical discharge extraction of bioactive compounds from *S. officinalis*



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The use of "green" solvents is driven by trends that are focused on finding solutions that minimize the use of solvents or find alternatives. Using the above mentioned solvents is directed towards intensifying the process of extraction and cost-effective production of high-quality extracts. The focus of the study was to use natural and bio-derived solvents in applications. Our goal was to develop, implement and promote the implementation of safer, greener technologies and sustainable industrial solvents. The focus was to select best solvents among water and bio solvent (polar, non-polar, protic and aprotic), including terpene, vegetable oil, MeTHF, NADES (natural eutectic solvent) and Switchable Solvents (Variable solvent) to extract bioactive compounds from sage (*S. officinalis*). Model predictive tools (Hansen, COSMO-RS) was used to predict the properties and behaviour of the interaction of solvent-solute, and to predict the most favourable performance of these solvents for targeted compounds. The extractions of 1g of sample in 50mL of solvents (water and ethanol) were achieved by high voltage electrical discharge device (IMP-SSPG-1200, Impel group, Zagreb, Croatia). Extraction were made using range of voltage from 15kV-25kV, at 100Hz frequency, during 3 and 9 min treatment time, using Argon as working gas. In this study bioactive compounds (α -thujone and camphor) from sage leaf (*S. officinalis*) were chosen for COSMO-RS and HANSEN calculations for the selection of green solvents for high voltage electrical discharge-plasma extractions. The best solvents for extraction predicted by COSMO-RS are ethanol, ethylacetat, methylacetat, CPME, DMC, MeTHE.

Biography

ANET REŽEK JAMBRAK, Associate professor is working at the Faculty of Food Technology and Biotechnology of the University of Zagreb, Croatia. She is working in the area of nonthermal and advanced thermal processing techniques, food chemistry, food physics, and process engineering. She also has strong international collaboration with renowned scientists. In the period from 2007. Anet Režek Jambrak has published over 80 significant scientific papers, published in top scientific journals with high impact factors (citation more than 1300, h-index 20). She is the winner of the 2016. Young Scientist Award from the International Union of Food Science and Technology.

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