EXTRACTION OF VOLATILE FATTY ACIDS USING NATURE BASED IONIC LIQUIDS

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The use of industrial waste streams as biomass source is one of the best choices to simultaneously reduce environmental problems and save resources. A new platform has been proposed using Volatile Fatty Acids (VFAs) for the production of biofuels and bio-based chemicals. This platform is a promising route to economically convert biomass into valuable products.[1] An emerging technology in microbial electrochemical research that provides an attractive route for the production of valuable products, such as VFAs, is microbial electrosynthesis (MES). However, the main disadvantage of the technology is the low concentration of these compounds in an aqueous solution, which makes their separation challenging.[2] Low volatile hydrophobic ionic liquids could offer a solution to this problem, as they have been applied as extractants for removal of compounds form aqueous phases due to their specific physicochemical properties.[3,4] Compared to the conventional separation methods (e.g., distillation, adsorption, precipitation) it is expected that ionic liquids can be used to separate VFAs from the diluted aqueous media using much less energy and generating less wastes.[5] In this work, hydrophobic nature-based ionic liquids are evaluated as extractants for the separation of VFAs (acetic, propionic and butyric acid) from water. The liquid-liquid equilibrium (LLE) of the ternary system comprising water, VFAs and ionic liquids (e.g., tetraalkylammoniumoleate) was determined at 298.15 K and atmospheric pressure. The obtained results were used to evaluate the influence of the cation, anion and length of the VFAs on the LLE data.

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