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## USING PHOSPHONIUM BASED IONIC LIQUID FOR RECOVERY OF ACETIC ACID BY REACTIVE EXTRACTION

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Carboxylic acids having a wide range of industrial applications are naturally produced in the fermentation process, at the end of this process the carboxylic acids are obtained as dilute aqueous solutions. Aqueous solutions are generally obtained in the form of carboxylic acid concentrations of 10% or less by weight. Purpose of the study; to prevent the characterization of useful, valuable carboxylic acids as waste. It is also an effective and environmentally friendly recovery. The study has been carried out on the recovery of formic acid, which has a wide range of applications from the nursery to the paint industry and is also important with its disinfectant properties. Among the many differentiation methods currently preferred, the reactive extraction method has been applied in the literature with classical solvents (toluene, decanol, etc). The effect on ionic liquid separation process, which is an environmentally friendly green solvent, is investigated in comparison with conventional solvents which are frequently used in the literature but have toxic effects. In the applied reactive extraction method, tri-n-octylphosphine oxide (TOPO), which is a

good complexing agent from the group of alkyl phosphine oxides and tripropylamine (TPA) from the tertiary amine group, was used as the reactant. Formic acid in an aqueous solution of 10.028 % by weight was prepared and the production medium was applied by fermentation. In the presence of TPA (tripropylamine), when an ionic liquid is selected as the solvent, maximum separation occurs in ionic liquid presence compared to other solutes. The water phase acid concentration decreased by 1.78%. 82 % separation efficiency was calculated. In the presence of TOPO (tri-n-octylphosphine oxide), Formic acid aqueous solution prepared by 10.08%. When an ionic liquid is selected, water phase acid concentration is 3.12%. The activity value has decreased by 62%. The use of amine as reactant is more advantageous in terms of separation activity compared to the presence of phosphine oxide. When environmental factors are taken into account, TOPO and ionic liquids will be more advantageous when the activity is taken for the second plan for a more environmentally sound separation.

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