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### Purification of phosphoric acid by liquid-liquid

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Phosphoric acid is a weak oxyacid with many industrial applications depending on its degree of purification, including surface treatments or fertilizer production (merchant grade Phosphoric Acid, MPA), salt production for animal feeding or acidification of food and drinks for human consumption (Food grade Phosphoric Acid, FPA), and pharmaceutical industry (Pharmaceutical grade Phosphoric Acid, PPA). In order to produce these different grades, various purification technologies can be implemented including hydrometallurgical processes as it is the case in the Prayon's process based on the selective liquid-liquid extraction of phosphoric acid. The current solvent used by Prayon's process for purifying phosphoric acid is a mixture of 90 wt% di-iso-propylether (DIPE) and 10 wt% tri-n-butylphosphate (TBP). There is very few information about the physicochemistry involved in the purification of wet phosphoric acid by liquid-liquid extraction because wet phosphoric acid is a very complex medium (highly concentrated medium which can reach 14 M, high complexing power, only few data on metal speciation in phosphoric acid, etc.). Furthermore, liquid-liquid extraction of phosphoric acid involves very complex phenomena such as phase splitting and third phase formation which can be explained by the presence of supramolecular species in solution as well as coextraction of large amount of water. In the present paper, the physicochemistry involved in phosphoric acid and water extraction by new extraction solvents is presented with a focus on decrypting the role of the supramolecular organization. Inedit data on the transitions from triphasic systems towards biphasic systems are presented and a focus has been placed on the description of forces playing a role in these transitions.

### Biography

Mariana Campos Assuncao is currently a PhD student at Chimie ParisTech conducting a research project on the purification of phosphoric acid in collaboration with Prayon. Before this experience, she has obtained a Master's degree in Nuclear Energy at Chimie ParisTech and an Engineering degree in Chemical Engineering at INSA de Rouen.

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