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New α -Functionalized Phosphorus Acid Surfactants: Synthesis, Dissociation Constants and Molecular Aggregation

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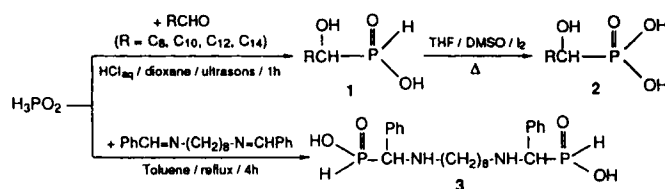
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New α -Functionalized Phosphorus Acid Surfactants : Synthesis, Dissociation Constants and Molecular Aggregation

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Pursuing our investigation into the reactivity of red phosphorus, its hydrolysis derivatives (PH_3 and H_3PO_2),^{1,2} and P-H labile compounds,³ we report here a convenient method for the direct synthesis of free α -hydroxyalkyl phosphinic acid surfactants from aqueous hypophosphorous acid and the long-chain aldehydes or imines under sonication.



The acids 1-3 can be considered as relatively strong acids and their extractant properties are under investigation. Self-association behavior of their ammonium salts shows the formation of micelles for the single-chain amphiphiles 1-2 and of vesicles for the bolaform 3. The dissociation constants and the critical micellar concentrations (CMC) are determined by potentiometry, tensiometry and ^{31}P NMR.

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