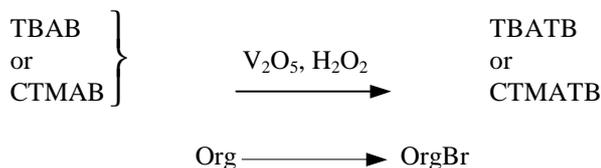


Chemistry of peroxo-vanadium(V) and fluorochromates(VI): Development of newer reagents and methodologies

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Dioxygen activated through coordination to the metal center of a metalloenzyme catalyses a variety of biochemical oxidation reactions. Based on the knowledge of the activity of one such enzyme, vanadium bromoperoxidase (VBrPO), and the information that emerged out of our investigation of reactivity of peroxovanadium(V) systems, environmentally benign synthetic protocols have been developed for the synthesis of brominating agents as well as for bromination of organic substrates leading to bromoorganics which have garnered a significant amount of commercial importance. Elicited strategies of the present investigation are highlighted with reference to tetrabutylammonium tribromide (TBATB) and cetyltrimethylammonium tribromide (CTMATB) as the reagents, and $V_2O_5-H_2O_2$ promoted regioselective bromination of organic substrates by tetrabutylammonium bromide (TBAB) as a methodology.



Sustained interest in the reaction chemistry of fluorochromates(VI) has now afforded a new reagent, 3,5-dimethylpyrazolium fluorochromate(VI), $C_5H_8N_2H[CrO_3F]$ (DmpzFC), with the desired physical properties. The reagent is highly soluble in organic solvents and is far less acidic than its companion reagents. DmpzFC is capable of very efficiently oxidizing polycyclic hydrocarbons and primary, secondary and allylic alcohols to the corresponding carbonyl compounds under mild conditions. Several applications and advantages of the reagent including its efficacy in readily transforming Δ^5 -steroids to Δ^5 -keto steroids are highlighted.