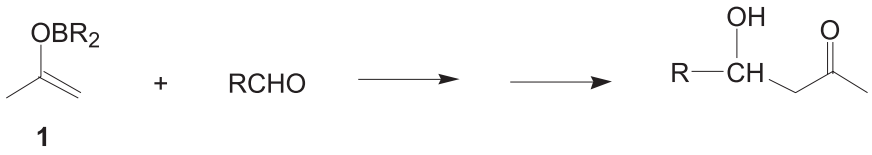
MY GRADUATE STUDENTS AND I

are interested in the discovery and development of new methods and reagents for use in synthetic organic chemistry. Our accomplishments include the development of the first general procedure for generating solutions of ester enolates. We are spending much of our

time exploring the reactions of these useful reagents with a wide variety of compounds including aldehydes and ketones, alkylating reagents, acylating reagents, and silicon halides. This work culminated in our report on the isolation of an ester enolate as a stable white solid, of high potential for use in synthesis.

Boron enolates (1) are known to exhibit high stereoselectivity in aldol reactions. At present, boron enolates must be prepared by an indirect route involving the prior synthesis



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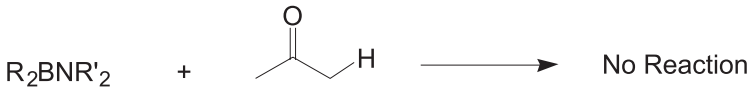
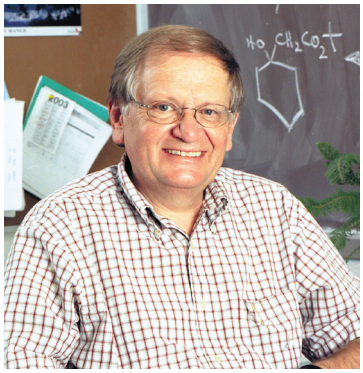
of a lithium enolate. We are attempting to discover boron bases which will react directly with carbonyl compounds, by proton transfer, to produce boron enolates. The various boron amides do not function as bases because of conjugation of the nitrogen with boron.



We have found that this problem can be overcome by substituting phosphorous for nitrogen. It is possible that this route to boron enolates will be as useful and general as the lithium amide route lithium enolates and we are actively studying this possibility.

Other work in progress includes studies on amide enolates, boron-stabilized carbanions, and transition metal salts of enolates.



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Discovering New Reagents

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