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Comparative study of solid state and solution aldol reaction of lithium enolate of pinacolone

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We reported the first systematic study of the solid-state aldol reactions of lithium pinacolone enolate with various aromatic solid aldehydes, in comparison with the same reactions performed in tetrahydrofuran (THF) solution. In solution, the reactions are selective with the aldol condensation product, except for the reaction involving 2-nitrobenzaldehyde. In the solid state, the reactions with THF-solvated lithium enolate of pinacolone showed the mixture of aldol condensation and aldol addition products. The usage of unsolvated lithium enolate of pinacolone in the solid state reactions resulted in a higher ratio of aldol addition to aldol condensation product than THF-solvated lithium enolate of pinacolone. At lower temperatures (0°C), the solid state reactions can afford a higher ratio of aldol addition to aldol condensation product in the system. The solid-state reactions generally afforded low yields and low conversion of the aldehydes. For those aldehydes with halogen group on the para position of benzaldehyde, the Tishchenko product was formed in a large amount in the system catalyzed by lithium enolate of pinacolone (as the strong base).

Biography

Huan Pang had his Bachelor's degree in Chemistry in University of Science and Technology of China and now pursues his Chemistry PhD degree at Brown University. He has published 3 papers in reputed journals. Recently, his research topic is focusing on the solid state organolithium chemistry.

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