INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Programme of Study : Ph.D.

Thesis Title: Application of Oxyma Based Reagents in Relevant Organic Transformations

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Thesis Submitted to the Department/ Center : Academic affairs, IIT Guwahati

Date of completion of Thesis Viva-Voce Exam : 16/05/2022

Key words for description of Thesis Work : Oxyma, *o*-NosylOXY, amides, ureas, thioacetals, racemization-free

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SHORT ABSTRACT

The work presented in this thesis is mainly focused on the different applications of the coupling reagent *ortho*-NosylOXY (**I**) to synthesize acetals, thioacetals, ureas, carbamates, and thiocarbamates. A newer methodology is also described to convert carboxylic acids into amides, dipeptides, esters, and hydroxamates. In chapter 1, the importance of the compounds mentioned above, their existing methodologies, and their drawbacks are discussed. Chapter 2 describes the synthesis of acetals and thioacetals from aldehydes using *ortho*-NosylOXY . In chapter 3, the racemization-free synthesis of ureas, carbamates, and thiocarbamates from carboxylic acids via Curtius rearrangement using *o*-NosylOXY is demonstrated. The mechanism study of the Beckmann rearrangement from ketoxime to amide using *o*-NosylOXY is extended in chapter 4. Finally, in chapter 5, a one-pot protocol to synthesize amides, peptides, esters, and hydroxamates using Oxyma and thionyl chloride with minimal racemization is proposed.