INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI **SHORT ABSTRACT OF THESIS**	

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Thesis Title:**Visible-Light-Driven C–S Bond Formation**		
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SHORT ABSTRACT

The contents embodied in this thesis are divided into four chapters including one introductory chapter based on experimental results obtained during the research period. The introductory chapter represents an overview of Visible-light-mediated C–S bond formations. This includes a brief discussion about the visible-light mediated C–S bond formation via difunctionalization of alkynes, C–H functionalization, and radical cyclization reaction. Since most of the chapters leading to the formation of C–S bonds under photocatalytic conditions so more focus given to the C–S bond forming reactions.

Chapter II demonstrates a metal-free route for the synthesis of (Z)-β-carboxy vinyl sulfones *via* difunctionalization of alkynes. Sodium arylsulfinates were used as the *S*–centered radical source under photocatalytic conditions.

Chapter III describes a visible-light-induced synthesis of thio-functionalized pyrroles using β-ketodintriles and thiophenols. under metal-free conditions. The reaction proceeds via the attack of thiyl radical to one of the nitriles followed by an imine amine tautomerization, nucleophilic attack of the amino group to the carbonyl, and loss of water molecule.

Chapter IV describes a visible-light/solar-light-driven synthesis of thio-funcionalized pyridines using γ-ketodintriles and thiophenols. The reaction proceeds *via* thiyl radical intermediacy.

Each of these chapters comprises seven subsections which include an introduction, previous work, present work, experimental section, references, spectral data, and a few representative spectra.