

**STUDIES ON THE MESOIONIC OXAZOLE-IMINE
SYSTEM AND 1,3 - DIPOLAR CYCLOADDITIONS
OF NITRONES IN AQUEOUS MEDIA**

**BY
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CERTIFICATE

This is to certify that the thesis entitled, "STUDIES ON THE MESOIONIC OXAZOLE-IMINE SYSTEM AND 1,3 DIPOLAR CYCLOADDITIONS OF NITRONES IN AQUEOUS MEDIA", being submitted by Mr. Inder kumar Pandey, to the Indian Institute of Technology, Delhi for the award of the degree of 'Doctor of Philosophy' in Chemistry is a record of bonafide research work carried out by him. Mr Inder Kumar Pandey has worked under my guidance and supervision, and has fulfilled the requirements for the submission of this thesis, which to my knowledge has reached the requisite standard. The results contained in this dissertation have not been submitted in part or in full, to any other University or Institute for the award of any degree or diploma.


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ABSTRACT

The first part of the dissertation describes investigations on synthesis and 1,3-dipolar cycloaddition of mesoionic oxazole-imine system with exocyclic N-phenyl and N-benzyl groups. It has been found that the system with exocyclic N-phenyl group exists in unprotonated form and is much more reactive as a 1,3-dipole than the previously known systems. It undergoes 1,3-dipolar cycloaddition even with olefins at room temperature to give substituted dihydropyrrole systems. At higher temperature, however, it probably rearranges to its ketenimine valence tautomer and becomes unreactive towards dipolarophiles. An attempt to use the above methodology for synthesis of an appropriate precursor for intramolecular cycloaddition of this mesoionic system has also been described.

The second part deals with the studies on 1,3-dipolar cycloaddition of nitrones in aqueous media. It has been found that like aqueous Diels-Alder reaction, the 1,3-dipolar cycloaddition reactions of C,N-diaryl nitrones are also considerably accelerated when they are performed in aqueous media. The effect of this hydrophobic association of reactants on regio- and stereochemical course of the reaction has also been examined. Interestingly, the aqueous

1,3-dipolar cycloaddition in presence of sodium deoxycholate gives highly diastereoselective reaction especially in the case of 4-substituted regioisomer.

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