

Executive Summary

Name of the Awardee : Dr. John Deepak D'Souza

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Title of the Project:

Synthesis and Characterization of some 1,4-Substituted 1,2,3- Triazoles by using Green Chemistry Methods.

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1,4-Substituted 1,2,3-triazoles are pharmaceutically important molecules and are mostly prepared by environmentally hazardous methods using large amounts of solvents which again are damaging to the environment.

Recently there is a tremendous effort to reduce the environmental signature starting from the preparation stage and throughout the entire life cycle of chemical compounds and considering limitations of an academic institute our effort is primarily directed at the preparation stage only.

Green chemistry, also known as sustainable chemistry, is the design of chemical products and processes that reduce or eliminate the use or generation of hazardous substances. Green chemistry applies across the life cycle of a chemical product, including its design, manufacture, and use.

OBJECTIVES OF THE CURRENT WORK

- i. To prepare the 1,4-substituted 1,2,3-Triazoles using green chemistry methods.
- ii. To study the purity of the compounds prepared by spectral studies
- iii. To study the characterization of the Synthesized complexes IR and ¹H NMR.
- iv. To study the biological activity of the prepared complexes.

With this in the background, we prepared few known and unknown 1,4-substituted 1,2,3-triazoles using a method which uses Water and DMF as solvent and also this is a single pot synthesis reaction. By this method different Bromo aryl compounds were reacted with Phenyl Acetylene in the presence of Sodium Azide and CuI in the presence of Glucosamide HCl.

The compounds that were prepared included

1. 1,4-Diphenyl-1H-1,2,3-Triazole

2. 1-(3-nitrophenyl)-4-phenyl-1H-1,2,3-triazole
3. 1-(4-nitrophenyl)-4-phenyl-1H-1,2,3-triazole
4. 1-(3-(4-phenyl-1H-triazol-1-yl)phenyl)ethanone
5. Phenyl(4-(4-phenyl-1H-1,2,3-triazol-1-yl)phenyl)methanone
6. 1-(4-(4-phenyl-1H-1,2,3-triazol-1-yl)phenyl)ethanone
7. 4-phenyl-1-(4-propylphenyl)-1H-1,2,3-triazole
8. 1-(4-methoxyphenyl)-4-phenyl-1H-1,2,3-triazole

The above compounds were characterised by FT-IR Spectra and ¹H NMR Spectra. The spectra agreed well with the synthesized compounds thereby proving the validity and robustness of the procedure employed.

Biological studies of the compounds was also done but only the compounds with NO₂, COCH₃ and OCH₃ groups showed some inhibition activity in the moulds.