

SYNTHESIS AND CHARACTERIZATION OF COUMARIN BASED FLUORESCENT POLYMERS

Neliswa Mama^{1,*}, Reuben Pfukwa² and Bert Klumperman²

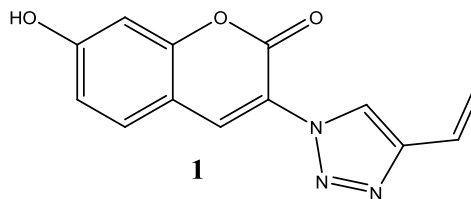
¹ Department of Chemistry, Nelson Mandela Metropolitan University, P.O.Box 77000, Port Elizabeth, 6031, South Africa.

² Department of Chemistry and Polymer science, University of Stellenbosch, Private Bag X1, Matieland, 7602, South Africa.

ABSTRACT

Coumarins are well-known compounds that have been studied extensively for their fluorescent properties. Substituent manipulation of the coumarin scaffold at various positions induces electronic structural changes that may enhance the fluorescence and/or shift the fluorescence band to longer wavelengths.¹ The copper-catalyzed Huisgen's 1,3-dipolar cycloaddition of alkynes with azides to form the triazole ring is a typical example of "click" reaction. This type of reaction is characterized by high yields, mild and simple reaction conditions, water tolerance, simple work-up of products, and is highly chemoselective in the formation of 1,2,3-triazole even in the presence of a large variety of functional groups.²

The research focuses on the synthesis of fluorescent polymers with pendant triazole-substituted coumarin side chain units. The Cu-catalyzed 1,3-dipolar cycloaddition reaction was utilized for the synthesis of a novel vinyl monomer, 7-hydroxy-3-(4-vinyl-1H-1,2,3-triazol-1-yl)-2H-chromen-2-one (**1**). The reversible addition-fragmentation chain transfer (RAFT) mediated polymerization was used to polymerize monomer **1**. Photophysical properties of the polymers were studied. Potential applications of the fluorescent polymers will be discussed.



References:

1. J. Wheelock, *J. Am. Chem. Soc.*, **81**, 1348, (1959)
2. M. S. Schiedel, C. A. Briehn and P. Bauerle. *Angew. Chem. Int. Ed.* **40**, 4677, (2001).