

Abstract

In the last three decades, alkyl 3-(dimethylamino)propenoates and related enaminones have been established as easily accessible building blocks for the preparation of various heterocyclic compounds. The widespread applicability of these compounds led to detailed studies of their preparation and following transformations. However, the properties and use of the 3-(dimethylamino)propenoates and related enaminons as ligands for the preparation of coordination compounds and as monomer units for the preparation of polymers has not been studied adequately.

Initially we prepared a new combinatorial library of bis-enamine compounds. With more than 95 % success rate of the synthesis and achieving the combinatorial requirements of 80/80, we confirmed the suitability of the selected method. The newly prepared ligands were then tested for their coordinational properties. We noticed that complexes were only formed with ligands containing a 1,2-diamine bridge. The catalytic activity of isolated copper complexes was analyzed in copper catalyzed cycloadditions between azomethine imines and inons (CuAIAC). We noticed that the catalytic efficiency of isolated complexes was tightly related to the structure of enaminone ligands. To improve the catalytic efficiency and to simplify the reuse of the catalysts from the reaction mixture we attached the catalysts on an insoluble matrix.

In the second stage of our research work, our attention was focused on the reactions between bis-(*N,N*-dimethylamino)enones and diamines dihydrochlorides. Changing the reaction conditions allowed us to produce a macrocycle as well as polymeric products. The morphology of the newly prepared polymers could be altered by changing the reaction conditions. Using the reaction vessels with fritted bottom, we managed to isolate polymers in the form of colored plastics, while the use of glass vials allowed us to prepare the coatings on glass. These newly prepared polymers are hydrolytically stable and absorb UV light while transmitting the visible light. On the account of the above-mentioned properties, these new materials could be used for the preparation of light filters.

Keywords: Enaminones, transamination, combinatorial chemistry, coordination compounds, catalysis, polymers