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Synthesis of new schiff base, Oxadiazole, Thiadiazole and Hemiaminals

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There is a continuing interest in the design and synthesis of molecules that efficiently bind to DNA and cleave it. In this regard, the use of bidentate NN chelating agents such as 1, 10-phenanthroline (then) has played an important role in synthetic and medicinal chemistry. They are capable of forming stable complexes with a wide variety of metal ions, some of which have also been found to exhibit interesting physicochemical properties and potentially useful chemotherapeutic properties. We, therefore, report here the synthesis and characterization of a number of new Schiff bases formed from 1,10-phenanthroline-2,9-dialdehyde and some sulfur-containing amines. Oxadiazole and thiadiazole ring containing compounds are also important classes of heterocyclic compounds and have created greater interest in synthetic organic and medicinal chemistry. New methods for the synthesis of 1,3,4-oxadiazole and 1,3,4-thiadiazole from 1,10-phenanthroline-2,9-dialdehyde have been developed. Zn^{+2} from $ZnCl_2$ played an important role in the formation of these products. Several new hemiaminals have also been synthesized from phenanthroline dialdehyde and di-pyridylaldehydes with 4-amino-3,5-dimethyl-1,2,4-triazole. The effect of solvents and reactant concentrations as well as their stability has been studied. Some hemiaminals were more stable in DMSO than others. But in solid form, all of these hemiaminals are similarly stable. The results indicated that hydrogen bonding plays a key role in the formation and stabilization of these hemiaminals.

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