The structural diversity and biological importance of nitrogen containing heterocycles have made them attractive targets for synthesis over many years. They are found in various natural products and have been identified as products of chemical and biological importance.\textsuperscript{1} Nitrogen heterocycles have been widely studied and used in the synthesis of numerous alkaloids. Their importance as precursors to many biologically active compounds have focussed a tremendous amount of attention on developing methods to functionalise these systems. The synthesis of nitrogen heterocycles and their derivatives occupy an important place in the realm of natural and synthetic organic chemistry due to their therapeutic and pharmacological properties. They have emerged as integral backbones of over seven thousand existing drugs.\textsuperscript{2-4} In addition to these important biological applications nitrogen heterocycles are ideal scaffolds for making libraries of drug like compounds and to generate libraries of inhibitors of HIV-1 protease.\textsuperscript{5-7}

Heterocyclic compounds are very widely distributed in nature and are essential to life. They play a vital role in the metabolism of all living cells. The pyrimidine and purine bases of DNA, essential amino acids, proline, histidine, tryptophan, the vitamin and co-enzyme precursors thyamine,
riboflavin, pyridoxin, folic acids, the B$_{12}$ and E families of vitamin, the photosynthesizing pigment chlorophyll, the oxygen transporting pigment, haemoglobin and its breakdown products, the bile pigments are heterocyclic compounds. Majority of synthetic heterocycles have found widespread, use as anticancer agents, analgesics, hypnotics, pesticides, weedicides and rodenticides. There are also a large number of synthetic heterocycles with other practical applications as dyestuffs, co-polymers, solvents, photographic sensitisers, developers, antioxidants, and vulcanisation accelerators in rubber industry.

Debus prepared the parent compound imidazole from glyoxal and ammonia and to indicate its source proposed the name 'glyoxaline'. The name imidazoles is due to Hantzsch. The first chemical study of imidazole was carried out by Wyss who substantiated the work of Debus. The heterocyclic compounds studied and presented in this thesis belong to imidazolinones (I).

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\text{I}
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This compound can be prepared by the reaction between glycine ethyl ester and imidic acid ester. During this reaction condensation of aldehydes and ketones with I gives the corresponding 4-Arylidene, or Alkylidene-2-imidazolin-5-ones.
These compounds can also be prepared from the corresponding azlactones by reaction with ammonia or amines followed by cyclisation. The active methylene group of (I) can undergo double Michael addition with divinyl ketones giving the corresponding spiro compounds. Imidazolinone I can further react with another molecule of imidic acid ester to give amino imidazolinones.

In the present work 2,4-disubstituted imidazolinones with pyridyl group at position 2 were synthesised and is discussed in Chapter I. Spiro imidazolinones containing pyridyl group were also synthesised and is given in chapter II. Synthesis of amino imidazolinones and their properties are discussed in chapter III. Chapter IV deals with the corrosion inhibiting property of the amino imidazolinones and the antimicrobial properties of the imidazolinones synthesised are discussed in chapter V.