Polarized ketene dithioacetals, ketene S,N-acetals and N,N-acetals which are easily derived from a variety of active methylene compounds, are versatile intermediates for the synthesis of novel heterocyclic compounds. In the present investigation, a systematic study was undertaken to further exploit α-oxoketene S,S-, S,N-acetals and O,S-acetals as useful three carbon fragments for the construction of a variety of novel heterocyclic ring systems. These studies have resulted in the development of new general methods for the synthesis of novel isoxazoles, pyrazolines, pyrazoles, dioxopyrroles, quinoxalines and pyridone derivatives.

In the first chapter, a brief survey of the various synthetic transformations using polarized ketene S,S-, S,N- and N,N-acetals derived in this laboratory is described.

In the second chapter, the reaction of α-oxoketene dithioacetals with hydroxylamine and hydrazine hydrate is discussed. The reaction with hydroxylamine affords 3-alkylthio and 5-alkylthio isoxazoles regioselectively in good yield. Reaction of α-styryl oxoketene dithioacetals and their higher enyl homologs with hydrazine hydrate yielded the pyrazolines and pyrazoles in good yields.

In the next chapter(III) annelation of S,N-acetals with oxalyl chloride to give 3-aroyl-2-alkylthio-1-aryl/benzyl/alkylpyrrol-4,5-diones and their further transformations to the corresponding 3-aroyl-2-arylamino/benzylamino/hydroxy-1-aryl/alkylpyrrol-4,5-diones and 3-aroyl-2-
arylaminohydroxy-1-arylpyrrolo[2,3-b] quinoxalines are described.

In the fourth chapter, a novel method for the synthesis of $\beta$-oxothionoesters and $\alpha$-oxoketene O,S-acetals from active methylene ketones and alkyl xanthates is reported. These $\alpha$-oxoketene O,S-acetals are converted to the corresponding alkoxy isoxazoles and alkoxy pyridones by treatment with hydroxylamine and cyanoacetamide anion respectively.