GENERAL METHODOLOGY
EXPERIMENTAL AND INSTRUMENTATION

The solvents are distilled and purified as per the procedures described in “A Text Book of Practical Organic Chemistry” by A. I. Vogel.

Purity of the compounds is checked by thin layer chromatography using silica gel ‘G’ (BDH) and hexane-ethyl acetate as eluent wherever necessary. Most of the compounds are purified by recrystallization from a suitable solvent. However, in some instances the compounds are purified by filtration through a column of silica gel (60-120 mesh) using appropriate solvents.

Melting points are recorded using Tempo Mel-Temp apparatus and are uncorrected. Microanalyses are performed using Perkin-Elmer 240C elemental analyzer. IR spectra are recorded on a Thermo Nicolet FT-IR 200 using KBr pellets and wave numbers are given in cm$^{-1}$. $^1$H and $^{13}$C NMR spectra are recorded in DMSO-$d_6$ operating at 300 / 400 MHz and 75.45 / 100 MHz, respectively on a Bruker Spectrospin and JNM $\lambda$-300 spectrometers. The chemical shifts ($\delta$, ppm) and coupling constants (Hz) are reported in the standard fashion with reference to either internal standard tetramethylsilane (for $^1$H) or the central line (39.5 ppm) of DMSO (for $^{13}$C). The mass spectra are recorded on Jeol JMS-D 300 and Finnign Mat 1210 B at 70 eV with an emission current of 100 $\mu$A. The microwave irradiation is carried out by using scientific microwave system CATA-2R operating at power levels from 140 W to 500 W. Built-in magnetic stirring (Teflon-coated stirring bar) is used in all operations. The temperature is measured throughout the reaction by flexible probe.

The spectral figures incorporated in the thesis are obtained by xeroxing the original spectra. All the figures, equations and schemes are drawn on ISIS Draw free ware and the compounds are numbered sequentially in the respective chapters in Times New Roman fonts.