In the past few years, chemistry under microwave heating has been under intense study with significant benefits in the area of organic synthesis. Microwave-enhanced chemistry is based on the efficient heating of materials by microwave dielectric heating effects. This phenomenon is dependent on the ability of a specific material to absorb microwave energy and convert it into heat. Microwave-assisted organic synthesis is characterized by the spectacular accelerations produced in many reactions as a consequence of a heating profile that cannot be reproduced by classical heating. This effect is particularly important in polymer supported reactions as they are very slow when conventional synthetic methods are used. The present study describes the successful use of polyvinylpyrrolidone-bromine complexes in various synthetic reactions under microwave irradiation and its comparison with conventional method of heating. The interdependence of the nature of the support, nature and extent of crosslinking, molar excess of the reagent and recyclability of these reagents under microwave and conventional heating condition are also described in this thesis.