CHAPTER I
INTRODUCTION

During the last 10 years remarkable advances have been made in the area of polymer blends both scientifically and technologically. This is manifested by growing number of monographs, publications and from the introduction of new commercial polymeric materials (Horrion *et al.*, 1988). A polymer blend is basically a mixture of two or more different polymers. The preparation of polymer blends is often a very useful way to develop materials with certain desired properties such as improved toughness, better processability, or better temperature and chemical resistance. In addition blending can usually be implemented more rapidly and economically than development of new chemistry. Therefore the use of polymer blends is becoming an important factor in the needs of specific sectors of the polymer industry owing to economic incentives (Xu Shengqing *et al.*,1998)

When two polymers are blended, it can result in either a miscible blend or an immiscible blend. Blending depends on thermodynamics of mixing. If the free energy of mixing is positive ($\Delta G_{mix} > 0$), the blending will result in immiscible blend with the polymer components as separate phases and poor adhesion between the phases. If the free energy of mixing ($\Delta G_{mix} < 0$) is negative then the polymer blend is miscible and consists of a single homogenous and thermodynamically stable phase. Moreover the formation of miscible blend requires the presence of favorable interaction between the component polymers. The miscibility is measured by numerous techniques such as Transparency, microscopic and glass-transition temperature, etc.

This research studies kinetic parameters of ESCOR^{TM} acid terpolymers and Ethylene-acrylic acid copolymer (EAA). Due to the crystallization kinetic of polymer is important to assessing their processing-property interrelationship. The physical and/or mechanical properties of these blends are dependent on the developed crystallinity and morphology govern by the combined influence (Kalkar and Deshpande, 2001). Whereas, the present study is also observed the miscibility of blend of ESCOR^{TM} acid terpolymers with different grades of ethylene-acrylic acid

(EAA1 – EAA5) copolymers between the two polymers (ESCOR™ and EAAs) containing acrylic acid groups, and it is thought that hydrogen-bonding interactions between these groups would likely to form substantial miscibility. In addition, Rheology, morphology and dynamic mechanical properties of the blends were also studied. The possible application of the ESCOR™/EAAs blends in vibration damping system are also studied.