CHAPTER I
INTRODUCTION

Blends of Polyethylene (PE) and Poly(vinyl chloride) (PVC) have been studied for improvement of mechanical properties. However, these blends quite often have properties poorer than those of their components, and therefore their application is limited. The reason for this is the unfavorable interaction between molecular segments of the components. A solution to these shortcomings may be found by adding functionalized polymer components, which can modify interfacial interactions between the two phases. PVC presents an inherent chemical functionality through the chloride groups. Thus, it is a convenient partner in blends where the other polymers has been functionalized. A typical functional group grafted onto PE, which can interact with PVC's chloride group, is methyl methacrylate (MMA). The free radical initiator, e.g. dicumyl peroxide (DCP), has been used often to initiate the grafting reaction between MMA and PE backbone. In this case, two blending processes are conceivable. First, PE is functionalized by MMA as a separate step, and the functionalized PE is then blended with PVC in a second mixing step. Second, both the functionalization and blending steps are executed in the same mixing equipment. The latter process is called one-step reactive blending. This process has many advantages in an industrial scale because it can save time, plant equipment, and cost.

In this work the mechanical properties of the same blends of MMA modified PE and unmodified PE with PVC produced by one-step reactive blending are presented in order to study the effects of the modification induced by this process on the final blends properties. These are explained by considering the different morphology and thermal properties of the blends.