

## **CHAPTER I**

### **INTRODUCTION**

The development of modified rubber by silica filler has received much attention in recent years. Bis-[3-(triethoxysilyl)propyl]tetrasulfide (Si-69) and mercaptopropyltrimethoxysilane (A189) are attractive for rubber application owing to alkoxy group for reacting with inorganic filler surface and sulfur as a vulcanizing group. Many studies are concerned with the preparation of rubber silica composite material aiming at the industrial level. However, few studies are concerned at the molecular level of silica and silane reaction which can be affected by the conditions of media polarity and silane concentration. It can be anticipated that the media polarity influences the orientation of the silane and filler particle, the adsorption behavior of silane onto silica, and the efficiency of the reaction for surface modification.

The present work focuses on the molecular level study of the silane treated silica under the effect from media polarity and the silane concentration. It is also the purpose to study the silane treatment efficiency using quantitative FTIR and SEC techniques.