CHAPTER I
INTRODUCTION

Thin-films play an important role in present day technological development and techniques of film deposition offer a major key to the fabrication of solid state microelectronic devices. They also have considerable potential uses in the electronic industry as capacitors, interconnecting insulator, and component parts for the more exploratory electronic technologies.

Chemical vapor deposition is an important and widely-used technique by which thin films can be prepared with high purity and quality. In this technique, constituents in the vapor phase react to form a solid film on the substrate surface.

Thin films that can be prepared by CVD cover a very wide range of materials, elements, as well as compounds, on various substrates. There are reactor systems for atmosphere pressure and low pressure (0.1 - 10 torr), and medium temperature (600 - 900 ^{o}C) and high temperature (800 - 1500 ^{o}C). Since many reactions can be accomplished at ambient pressure, the need for expensive high vacuum equipment can be avoided.

In CVD, the vapor/vapor mixture that enters a chamber containing the substrate maintained at a suitable temperature reacts to form a solid film on the substrate surface. The chemical reaction taking place is a very important characteristic in all CVD processes. Flow rate, gas composition, deposition temperature, pressure, and chamber geometry are the process variables by which thin film deposition is controlled.

The objective of this research is to study the deposition of poly(methyl methacrylate) thin film through vapor phase monomer deposition under

atmospheric pressure. The effects of deposition time, nitrogen flow rate, substrate temperature, amount of photoinitiator on substrate, and irradiation time on molecular weight, thickness and surface of deposited film are studied.