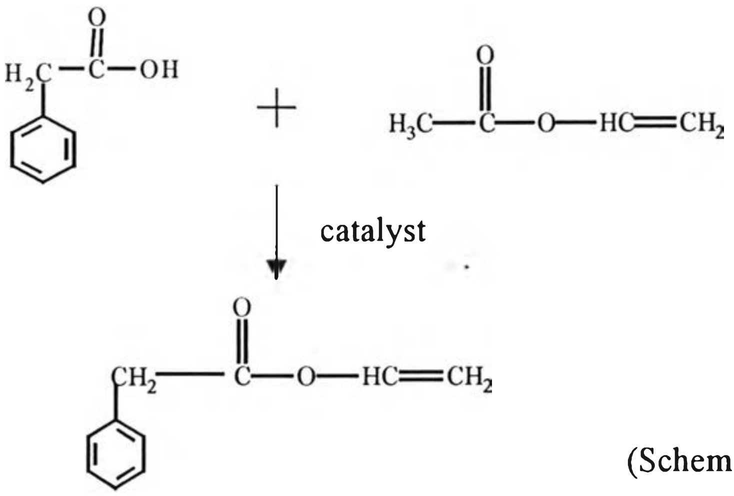
CHAPTER II
LITERATURE SURVEY

Gwilym J.Rees synthesized vinyl phenyl acetate by ester interchange reaction between phenyl acetic acid and vinyl acetate utilizing a catalyst.



(Scheme 1)

Copolymerization with vinyl chloride, in a suspension system using a peroxide catalyst, was described on a laboratory and pilot plant scale. Monomer-copolymer compositions, for an initial charge consisting of vinyl chloride-vinyl phenyl acetate (80/20 by weight), were presented over a range of conversions. Discs molded from the unstabilized copolymers show very good clarity and color stability, which improve with inkcreased comonomer loading. Some retention of unpolymerized vinyl phenyl acetate monomer occurred,and some increase in softening points resulted following two reprecipitations from acetone into excess methanol. Compound from a 96/4 vinyl chloride/vinyl phenyl acetate copolymer has better color stability. The enhanced color and heat stability of the copolymers is attributed to the aromatic character of the comonomer vinyl phenyl acetate.

Alan E. Tonelli reported the FTIR characterization of ethylene-vinyl chloride (E-V) copolymers. The copolymer were prepared by partial reduction of PVC with tri-*n*-butyltin hydride. The infrared spectra of E-V copolymer were examined. As the concentration of ethylene units increases the 750 cm^{-1} peak decreases and the 720-730 cm^{-1} resonance increases in importance since this resonance arises from the long sequences of ethylene units. The positions and intensities of the IR resonances have been correlated with the chain microstructures which were determined by ^{13}C NMR analysis.

A.S. Brar et al. reported the microstructure of vinylidene chloride-methyl acrylate copolymers prepared by a photopolymerization process using uranyl ion as photosensitizer and analyzed by one and two-dimensional NMR spectroscopy. Sequence distribution was calculated from ^{13}C distortionless enhancement by polarizationless enhancement by polarization transfer spectrum was used to differentiate between the resonance signals of methoxy and methylene units in the copolymer. Comonomer reactivity ratios were determined using Kelen-Tudos and the nonlinear error in variables methods. The sequence distribution of vinylidene chloride and methyl acrylate-centered in triads determined from $^{13}C\{^{1}H\}$NMR spectra of copolymers is in good agreement with triad concentrations calculated from statistical model and Monte Carlo simulation methods. 2D heteronuclear single quantum correlation and correlated spectroscopy spectrum was used to analyze the complex ^{1}H NMR spectrum.

Yuesheng Li et al. reported the structure and thermal properties of vinylidene chloride-acrylic copolymers. A series of vinylidene chloride (VDC) copolymers with methyl acrylate (MA) or butyl acrylate (BA) as comonomer (not more than 10%) was prepared by free-radical suspension copolymerization. The effects of comonomer structure, copolymer composition, reaction condition and thermal properties were investigated. VDC copolymers with 3-10% MA are semicrystalline polymers and the crystal phases consist of more than one crystalline structure same as PVDC. VDC copolymers with low MA content have two melting endothermic peaks and those with low MA content have only one melting endothermic peak. The melting temperatures of MA/VDC copolymers increase gradually as MA increases. The end temperatures of the melting endothermic peak of MA/VDC copolymers are considerably decreased with increase in MA content, whereas the decomposition temperatures of VDC copolymers are slightly increased gradually with increase in MA content. The processing temperatures of MA/VDC copolymers are gradually decreased with increase in MA content and the range of processing temperatures of those is gradually increased as MA content increases. BA/VDC copolymers have lower processability than MA/VDC copolymers with same VDC content. The melting temperatures of VDC copolymers with 7% MA increase gradually as polymerization temperature increase in the range of 50-80°C, and their decomposition temperatures and offset temperatures are almost independent of polymerization temperature on the processability of VDC copolymers with 7% MA is relatively low.

S. Krimm and C. Y. Liang studied the difference of polarized infrared spectra of poly(vinyl chloride), poly(vinylidene chloride) and high vinylidene chloride/ low vinyl chloride copolymers of difference composition in the range of about 70 to 3000 cm^{-1}. The samples were in the form of thin solid films. Orientation was introduced by stretching or rolling the films. This was most feasible for the copolymer films, those of the pure polymers were too brittle to permit any significant orientation. All samples were checked for the absence of bands due to plasticizer or the solvent used in casting the film.