



Ain Shams University
University college for Women
(Arts, Science & Education)

Preparation and Polymerization of New Fluoromaleimide Derivatives

A Thesis Submitted in Partial Fulfillment for
the Requirement of
the Degree of Master of Science in Chemistry

by

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To

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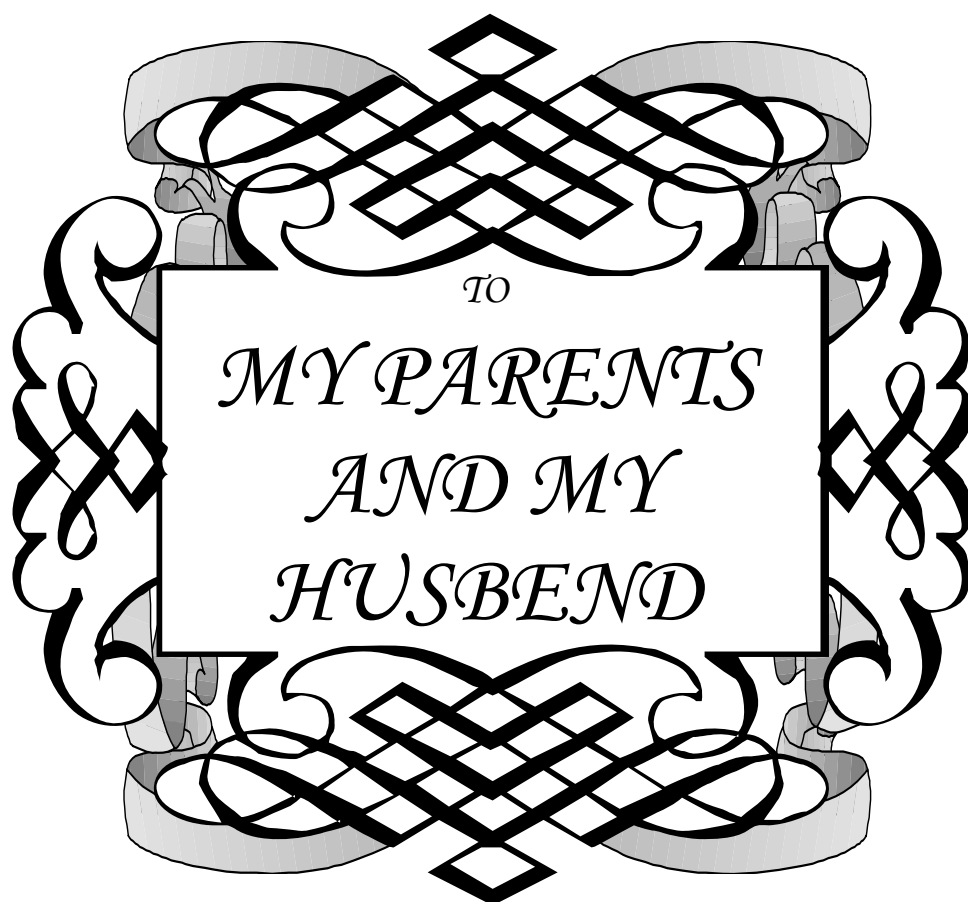
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TO

*MY PARENTS
AND MY
HUSBEND*

ABSTRACT

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Preparation and Polymerization of new Fluoromaleimide Derivatives

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Novel 4-(4'-trifluoromethyl) phenoxy N-phenyl maleimide (FPMI) was synthesized and characterized by elemental analysis. The free radical- initiated polymerization of FPMI was carried out in 1,4 dioxane as a solvent using azobisisobutyronitrile as initiator. The monomer and polymer were investigated by ^1H NMR and FTIR. The effect of the monomer concentration, initiator concentration and temperature on the rate of polymerization (R_p) was studied. The molecular weight average ($\overline{M}_w$ and $\overline{M}_n$) and polydispersity index of the polymer were determined by gel permeation chromatography and were equal to 73,5000, 16,7000 and 2.27 respectively. The properties of PFPMI and the copolymer including thermal behavior, thermal stability, photo-stability, solubility and intrinsic viscosity were studied. Moreover the monomer reactivity ratios for the copolymerization of FPMI (M_1) with MMA (M_2), (VAc, M_2) were calculated by three different methods. It has been found that the FPMI polymer and the copolymer of the prepared monomer with VAc and MMA have biological activity.

Keywords: Fluoro-maleimide polymers, FTIR, NMR, Free-radical polymerization, Copolymerization kinetics, Thermal analysis, Methyl methacrylate, vinyl acetate and Biological activity.

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