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

Fatma Ahmed Mahmoud Gomaa

To

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

UNDER SUPERVISION OF:

Prof. Dr. Samia M. Mokhtar
Professor of Physical Chemistry
University College for Women
Ain Shams University, Egypt

Dr. Sakina M. Abd-ElAziz
Physical Chemistry Lecturer
University College for Women
Ain Shams University, Egypt

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APPROVAL SHEET

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Board of Advisors Approved:

Head of Chemistry Department

Prof. Samia M. Mokhtar

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QUALIFICATION

Student Name : **Fatma Ahmed Mahmoud Gomaa**

Scientific Degree : B. Sc. (Chemistry)

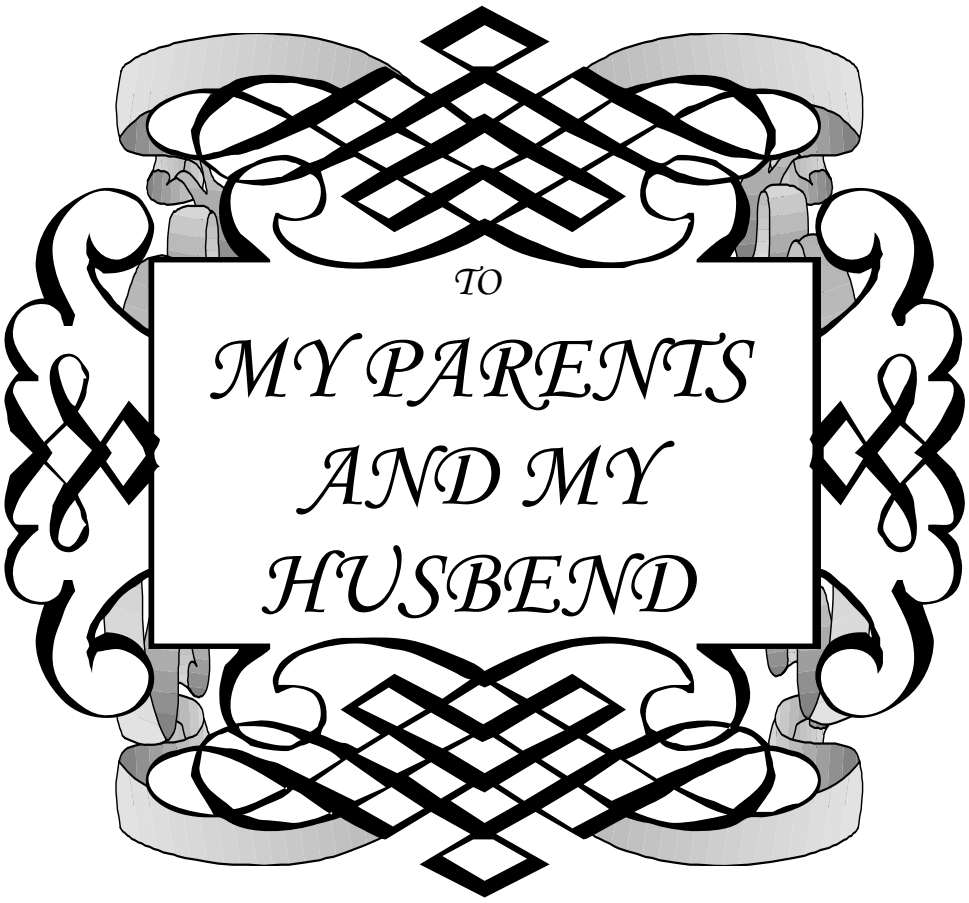
Department : Chemistry

Faculty : University College for Women
(Arts, Science and Education)

University : Ain Shams

B.Sc. Graduation Date : May 2005

M. Sc. Graduation Date :


TO
MY PARENTS
AND MY
HUSBEND

ABSTRACT

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Preparation and Polymerization of new Fluoromaleimide Derivatives

Student name: Fatma Ahmed Mahmoud Gomaa
University College for Women
(Arts, Science and Education)
Ain Shams University

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 ^{1}HNMR and FTIR. The effect of the monomer concentration, initiator concentration and temperature on the rate of polymerization (Rp) 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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