

# Ain Shams University Faculty of Science Department of Chemistry

# Preparation and Characterization of Polyurethanes for Flexible Packaging Applications

A Thesis Submitted the Ph.D. in Science (Chemistry)

#### Presented by

#### Mahmoud Abd El-Rahman Ibrahim

Under the Supervision of

#### Dr. Mohamed Ahmed Mekewi

Prof. of Polymer Chemistry, Department of Chemistry, Faculty of Science, Ain Shams University, Cairo

#### Dr. Ahmed Mohamed Ramadan

Prof. of Polymer Chemistry, Department of Chemistry, Faculty of Science, Helwan University, Cairo

#### Dr. Farida El Darse

Prof. of Analytical Chemistry, Department of Chemistry, Faculty of Science, Helwan University, Cairo

#### Dr. Mona Hassan Abd El-Rehim

Asso. Prof. of Packing and Packaging Materials, National Research Centre, Dokki, Cairo

#### Dr. Nabaweya Ali Mossa

Asso. Prof. of Physical Chemistry, Department of Chemistry, Faculty of Science, Ain Shams University, Cairo

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Name of the Candidate: Mahmoud Abd El-Rahman Ibrahim

#### Thesis Advisors:

#### Dr. Mohamed Ahmed Mekewi

Prof. of Polymer Chemistry, Department of Chemistry, Faculty of Science, Ain Shams University

#### Dr. Ahmed Mohamed Ramadan

Prof. of Polymer Chemistry, Department of Chemistry, Faculty of Science, Helwan University

#### Dr. Farida Mohamed Saad El-Din El Darse

Prof. of Analytical Chemistry, Department of Chemistry, Faculty of Science, Helwan University

#### Dr. Mona Hassan Abd El-Rehim

Asso. Prof. of Packing and Packaging Materials, National Research Centre, Cairo, Egypt

#### Dr. Nabaweya Ali Mossa

Asso. Prof. of Chemistry, Department of Chemistry, Faculty of Science, Ain Shams University

**Head of Chemistry Department** 

Prof. Dr. Hamed Ahmed Younis Derbala

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#### LIST OF ABBREVIATIONS

US United States

**LDPE** Low Density Polyethylene

**HDPE** High Density Polyethylene

**LLDPE** Linear Low Density Polyethylene

**PP** Polypropylene

**OPP** Oriented Polypropylene

**PVC** Polyvinyl Chloride

**BOPP** Biaxially Oriented Polypropylene

**PET** Polyester

**BOPET** Biaxially Oriented Polyester

**IUPAC** International Union of Pure and Applied Chemistry

**DEHP** Diethylhexyl Phthalate

**PU** Polyurethane

**TPUs** Thermoplastic Polyurethanes

**TPUEs** Thermoplastic Polyurethane Elastomers

**DI** Diisocyanate

**MDI** Diphenylmethane Diisocyanate

**TDI** Toluene Diisocyanate

**HDI** Hexamethylene Diisocyanate

**IPDI** Isophorone Diisocyanate

**DBTDL** Dibutyltin Dilaurate

**PTMG** Polytetramethylene Glycol

**PPG** Polypropylene Glycol

STD Standard

**PEG** Poly (ethylene) Glycol