# بسم الله الرحمن الرحيم


MONA MAGHRABY

# شبكة المعلومات الجامعية

# التوثيق الالكتروني والميكروفيلم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

# جامعة عين شمس

# التوثيق الإلكتروني والميكروفيلم

# قسم

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***MONA MAGHRABY***

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كليه العلوم – قسم الكيمياء

# Synthesis, Characterization and Application of Polymeric Dispersants for Inkjet inks Industry

Thesis Submitted by

**Mohamed Ahmed Abdelaziz Mohamed**

B.Sc. (Chemistry) 2010
M.Sc. (Chemistry) 2017

**For the requirement of Ph.D. Degree of Science in Chemistry**

**To**

**Department of Chemistry**

**Faculty of Science**

**Ain Shams University**

Ain Shams University
Faculty of Science
Department of Chemistry

كليه العلوم – قسم الكيمياء

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Thesis Submitted for Degree of Ph.D.

**In**

**Chemistry**

Presented by

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M.Sc. Chemistry (2017)

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كليه العلوم – قسم الكيمياء

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**"I DEDICATE THIS WORK TO THEM & TO MY SON YAHYA"**

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# Vivid application of polyurethane as dispersants for solvent based inkjet ink

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## Abstract

The present article explores the usage of functionalized urethane of robust affinity to pigment through the reaction of polyurethane adduct with different types of polyether in order to improve the pigment dispersion stability, color and wetting properties. The raw materials and prepared dispersants were characterized by FTIR, GPC, Non-volatile content. The properties and dispersing ability of the dispersants were also investigated by measuring ink viscosity, Rheology, surface tension and particle size. The prepared polymeric dispersants were employed as dispersing agents for solvent-based inkjet ink application. The adhesion and color properties of prepared ink also were studied. All dispersants possessed high gloss comparing to blank after storage stability and low particle size and surface tension except PUD 5, 6, all dispersants showed no negative affect on adhesion of ink on printed PVC film and possessed excellent dispersing ability and rheological properties indicated by low ink viscosity for most commonly used cyan pigment C.I. 15:4.

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## Keywords

Inkjet; Printing inks; Polymeric dispersants; Dispersion; Polyurethane

# ABSTRACT

# ABSTRACT

The present research work covenants with the preparation, characterization and validation of environment friendly polymeric dispersants by means of urethane linkage and functional groups that of affinity to dominant pigments by reaction of polyurethane adduct with different types of polyether.

The polyurethane adduct were prepared either from petrochemical based or green based. The raw materials and prepared dispersants were characterized physicochemically and structurally (FT-IR, GPC, mechanical and optical properties).

The prepared polymeric dispersants were employed as dispersing agents for solvent-based inkjet ink application.

The devised dispersants exhibited respectable optical and mechanical properties and possessing excellent dispersing ability for prominently employed cyan pigment C.I. 15:4 and red pigment C.I.146



**Keywords:** Inkjet; Printing inks; Polymeric dispersants; Dispersion; Polyurethane; castor oil.

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