International University of Africa

Deanship of graduate studies

Synthesis and Characterization Of Phenol-Formaldehyde Resins

A thesis submitted in partial fulfillment of the requirements of the M.Sc. degree in industrial chemistry

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August 2017


بسم الله الرحمن الرحيم

الآيـة

قال الله تعالى :

﴿ وَقُل رَّبِّ زِدْنِي عِلْمًا ﴾

صدق الله العظيـم

سورة طه الآية (114)

Dedication

This work is dedicated to your parents,

brothers, sisters and friends for their love,

help and support

Acknowledgment

I must hank the almighty Allah for blessing me abundantly and helping me with everything I needed throughout my studies.
I would like to express my deepest and profound gratitude for my supervisor ***Dr. Mohammed Mirghani*** for his advices, guidance, inspiration, and his great efforts to explain things clearly and simply.
I would like to thank the staff of the chemistry department college of science for their cooperation and support technical.

مستخلص البحث

في هذه الدراسة تم تصنيع وتشخيص بوليمر فينول– فورمالدهيد، الناتج من تفاعل التكاثف بين الفينول والفورمالدهيد في وجود محلول هيدروكسيد الصوديوم(40 %) كمحفز لهذا التفاعل وتصنيع وتشخيص بوليمر فينول –فورمالدهيد الناتج من تفاعل التكاثف بين الفينول والفورمالدهيد في وجود حامض الخل الثلج وحامض الهيدروكلوريك المركز كمحفز.أستخدمت الأشعه تحت الحمراء ودليل انسياب المصهور لتشخيص البوليمر المصنع .تقنية الأشعه تحت الحمراء اظهرت نجاح عملية التصنيع وذلك لوجود قمم الإمتصاص المميزه لمجموعة CH_2الجسريه عند ($2914cm^{-1}$) ومجموعة C-O-C الرابطة عند$^{-1}$cm(1143).

Abstracts

In this study phenol-formaldehyde resin was synthesized by condensation reaction between phenol and foraldehyde in the presence of sodium hydroxide solution (40%) as base catalyst.and phenol formaldehyde resin was synthesized by condensation reaction between phenol and formaldehyde in the presence of glacial acetic acid and concentrated hydrochloric acid as catalysts. FTIR spectroscopy and melt flow index were used to characterize the synthesized polymer. FTIR analysis has shown the successful synthesis of the polymer because of the presence of two characteristics absorption peaks for linkage ch2 (2914 cm^{-1}) and linkage group C-O-C (1143Cm^{-1}).

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