J. Saudi Chem. Soc.; Vol. 4, No. 1, pp. 43-52 (2000)

SYNTHESIS AND CHARACTERIZATION OF NOVEL ORGANOTIN MONOMER OF N-(TRI-n-BUTYLTIN)MALEIMIDE, XMOPOLYMERIZATION AND COPOLYMERIZATION WITH STYRENE*

Nayef S. Al-Muaikel, Salem S. Al-Diab, Hamad Z. Alkhathlan and Ahmed S. Al-Obied
King Saud University, College of Science, Chemistry Dept.
Riyadh 11451- P.O. Box 2455- Saudi Arabia
(Received 19th May 1999; Accepted 5th July 1999)

لقد أمكن تحضير الأحادي الجديد ن-ثلاثي بيوتيل قصدير الميلاميد من تفاعل الميلاميد مع أكسيد ثلاثي بيوتيل القصديـــر ، كما أمكن تحضير البوليمر المتجانس لذلك الأحادي و البلمرة المشتركة له مع الستايرين ، وقد تمت دراسة الذوبانية وطيـف الأشعة تحت الحمراء وطيف الرنين النووي المغناطيسي وكذلك تقدير معدل الوزن الجزيئي للبوليمر المتجـــانس والمشـترك بواسطة كروماتوجرافيا النفاذية بالجل.

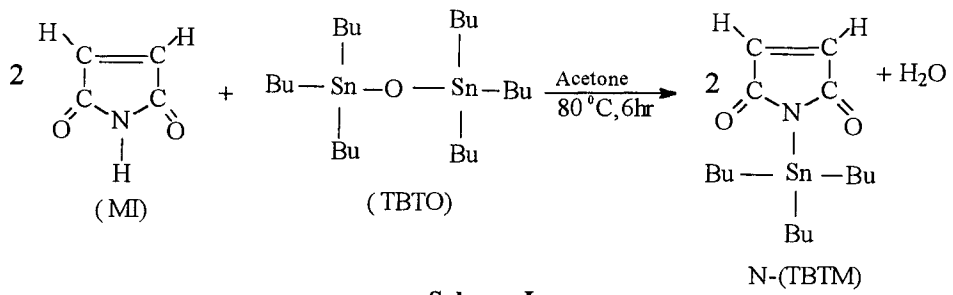
New monomer, N-(tri-n-butyltin)maleimide N-(TBTM) was prepared by the reaction of maleimide(MI) with Tri-n-butyltinoxide (TBTO) in the presence of acetone as a solvent. The prepared monomer was copolymerized with styrene(ST) using benzene as solvent with 1 mol. % of 2,2'-azobisisobutyronitrile (AIBN) as free radical initiator. The structure of new monomer, homopolymer and copolymer have been characterized by elemental analysis, solubility, the molecular weights of the homopolymer and copolymer have been characterized by GPC, IR and NMR spectral studies.

INTRODUCTION

Maleimide and its N-Substituted derivatives are 1,2-disubstituted ethylene. Their radical polymerization and copolymerization behavior and thermal properties of the polymers have been extensively studied by many workers [1]. Polymaleimide derivatives have been recently used as new vinyl polymer with merits of facility of polymer production (High polymerization reactivity of the monomers) and excellent thermal stability [2,3].

Organotin monomers and polymers have been investigated as long-lived, film forming and antifouling coatings with steady leaching of the organotin compound [4,5] and wood preservatives [6]. However, there is no report as we know on maleimide polymerization of which tri-butyltin group protects N-H group.

The present paper investigates the synthesis of new organotin monomer, homo and copolymerization of N-(tri-n-butyltin) maleimide with styrene. This category of new hetrocyclic organotin polymers is expected to be used as wood preservatives, protective agent against both green and brown algae, biocides, stablizers, antifouling coating, and anti bacterial activity.



Scheme I