Summary

In the present work a new acrylic monomer were prepared. Thus, o-methacrylamidobenzoic acid (o-MAB) was prepared by the reaction of methacrylic acid with o-aminobenzoic acid in the presence of N, N-dicyclohexylcarbodiimide (DCCI) as a condensing agent or by the reaction of methacryloylchloride with o-aminobenzoic acid. Also, o-methacrylamido-tri-n-butyltin benzoate was prepared by esterification of o-methacrylamidobenzoic acid (o-MAB) with bis (tri-n-butyltin) oxide.

The structure of these monomers was investigated by IR and ^{1}H NMR spectroscopy. The copolymerization and terpolymerization reaction of the prepared organotin monomer with various vinyl monomers were investigated.

Binary Copolymerization reactions of o-methacrylamido-tri-n-butyl tin benzoate (o-MTBTB) with each of methylacrylate (MA), ethyl acrylate (EA), n-butylacrylate (BA), methylmethacrylate (MMA) butylmethacylate (BuMA), Glycidylmethacrylate (GMA), Styrene (ST) acrylonitrile (AN), and vinylacetate (VA) were studied. The monomer reactivity ratios for these systems were calculated by both Fineman-Ross and Kelen- Tudos methods are given in the following table:

System M_1-M_2	Fineman-Ross Method		Kelen-Tudos method	
	r_1	r_2	r_1	r_2
o-MTBTB-MA	0.25 ± 0.06	5.01 ± 0.05	0.22 ± 0.05	5.05 ± 0.03
o-MTBTB-EA	0.24 ±0.04	5.10 ± 0.03	0.21 ± 0.05	5.08 ± 0.04
o-MTBTB-BA	0.17 ± 0.03	6.85 ± 0.03	0.15 ± 0.03	6.77 ± 0.02
o-MTBT-MMA	0.16 ± 0.05	6.31 ± 0.06	0.14 ± 0.07	6.22 ± 0.04
o-MTBTB-BMA	0.24 ± 0.04	5.01 ± 0.03	0.20 ± 0.04	4.99 ± 0.03
o-MTBTB-GMA	0.19 ± 0.03	5.08 ± 0.02	0.17 ± 0.03	5.72 ± 0.04
o-MTBTB-ST	0.21 ± 0.04	5.06 ± 0.05	0.19 ± 0.05	5.04 ± 0.06
o-MTBTB-AN	0.20 ± 0.03	6.06 ± 0.03	0.18 ± 0.04	6.44 ± 0.04
o-MTBTB-VA	0.17 ± 0.04	5.50 ± 0.02	0.16 ± 0.03	5.45 ± 0.04

It was found that the monomer reactivity ratio values of o-MTBTB(r_1) are very small which indicate that the growing radical ending with o-MTBTB unit prefers M_2 monomer than M_1 monomer in propagation stage. The sequence distribution of the monomer unit along the copolymer chains were calculated from the monomer reactivity ratios on the basis of terminal copolymerization model. The Q and e values were calculated for o-MTBTB and were found to be Q = 0.43, e = 0.13 respectively. The structure of these copolymers were established by IR and ^{1}HNMR spectroscopy.

The composition curves of the binary systems indicate that all systems studied don't give azeotropic compositions and also show that the copolymer produced have a lower content of the organotin monomer than the commoner mixtures.

The prepared copolymers and terpolymers were soluble, colourless, transparent and suitable for film formation. Thus, organotin monomer was implicated in thirteen copolymer and terpolymer compositions and their film properties were investigated on glass and metal plates.

The controlled release of the prepared copolymers and terpolymers was carried out in aqueous media and the tin % was measured after (7,14, 21, 28, 35, 42, 50, 57, 63 and 70) days. The results show that the release of tri-n-butyltin oxide increase with increasing the percent of organotin polymers.