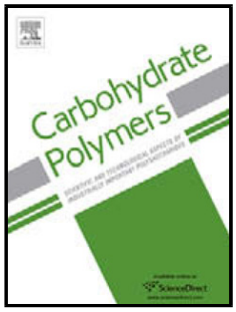

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PII: S0144-8617(13)00957-0
DOI: http://dx.doi.org/doi:10.1016/j.carbpol.2013.09.065
Reference: CARP 8154

To appear in:

Received date: 27-7-2013
Revised date: 28-8-2013
Accepted date: 18-9-2013

Please cite this article as: Kök, G., Ay, K., Ay, E., Doğan, F., & Kaya, İ., Synthesis, characterization and non-isothermal decomposition kinetic of a new galactochloralose based polymer, Carbohydrate Polymers (2013), http://dx.doi.org/10.1016/j.carbpol.2013.09.065

Synthesis, characterization and non-isothermal decomposition kinetic of a new galactochloralose based polymer

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Abstract

A glycopolymer, poly(3-*O*-methacroyl-5,6-*O*-isopropylidene-1,2-*O*-(*S*)-trichloroethylidene-*α*-D-galactofuranose) (PMIPTEG) was synthesized from the sugar-carrying methacrylate monomer, 3-*O*-methacroyl-5,6-*O*-isopropylidene-1,2-*O*-(*S*)-trichloroethylidene-*α*-D-galactofuranose (MIPTEG) via conventional free radical polymerization with AIBN in 1,4-dioxane. The structures of glycomonomer and their polymers were confirmed by UV-Vis, FT-IR, ^{1}H-NMR, ^{13}C-NMR, GPC, TG/DTG-DTA, DSC, and SEM techniques. SEM images showed that PMIPTEG had a straight-chain length structure. On the other hand, the thermal decomposition kinetics of polymer were investigated by means of thermogravimetric analysis in dynamic nitrogen atmosphere at different heating rates. The apparent activation energies for thermal decomposition of the PMIPTEG were calculated using the Kissinger, Kim-Park, Tang, Flynn-Wall-Ozawa (FWO), Kissinger-Akahira-Sunose (KAS) and Friedman methods and were found to be 100.15, 104.40, 102.0, 102.2, 103.2 and 99.6 kJ/mol, respectively. The most likely process mechanism related to the thermal decomposition stage of PMIPTEG was determined to be a D_n Deceleration type in terms of master plots results.

***Keywords**:* Carbohydrate based polymer, chloralose, thermal analysis, decomposition kinetic, methacrylate.

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