INVESTIGATING OF POLYSULFIDE AND EPOXY-POLYSULFIDE COPOLYMER CURING

Abdouss, Majid 1; Farajpour, Tohid 2; Salarieh, Hamid 2

1Department of chemistry, Amirkabir university of technology, Hafez Ave., Tehran, Iran, 2Engineering research Institute, Fath highway, Soliran Ave., Tehran, Iran.

*Corresponding author Email: majidabdouss@yahoo.com

Polysulfide can be cured in various methods. In this work, the effect of various oxidative curing agents (manganese dioxide and para quinonedioxime) in presence of curing accelerator (Diphenylguanidine) on mechanical-dynamical properties and cure time of polysulfide resin (G4) was investigated. Results showed that mentioned oxidative curing agents have no remarkable effect on mechanical properties and cure time. But preferred method is preparation of polysulfide-epoxy copolymer. This copolymer is a new class of liquid polymer composition containing block copolymers, with alternating blocks of polysulfide and polyepoxide. In different epoxy/polysulfide ratio, the epoxy-polysulfide copolymer showed different tensile strength, elongation, hardness, gel time, viscosity and Tg, but epoxy free polysulfide approximately revealed constant mechanical and dynamical properties so that epoxidized polysulfide had excellent mechanical properties and suitable curing times in comparison with those samples which were cured in other methods. FT-IR spectroscopy, viscometry and GPC were used to verify the formation of epoxy-polysulfide copolymer. Results obtained from DMTA and SEM showed that phase separation of epoxy resin from the copolymer matrix took place and the glass transition temperature (Tg) of the cured copolymer was between the cured epoxy and polysulfide glass transition temperatures.