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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 showd different tensile strenght, elongation ,hardness, gel time, viscosity and T_g, but epoxy free polysulfide approximately revealed constant mechanical and dynamical properties so that epoxidized polysulfide had excellent mechanical properties and suitable curring 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 (T_g) of the cured copolymer was between the cured epoxy and polysulfide glass transition temperatures.