

HBS lignin in the rubber Modification

HBS lignin (hereinafter referred to as HBS lignin) is a method of using a high boiling solvent extracted from plant material lignin. HBS Lignin is a new type of environment-friendly materials, and the traditional paper "black liquor" in the lignin sulfonate and alkali lignin compared with the greater chemical reactivity, this use of its characteristics, were prepared latex of Shen epoxidized HBS HBS lignin and lignin, and the reaction product was analyzed by infrared spectroscopy, surface area and an epoxy equivalent of characterization, test results show that the epoxy modified coprecipitate is effective.

Epoxidation HBS lignin cross-linking agent used as curing neoprene (CR), epichlorohydrin rubber consumption is affecting the performance of the main factors. HBS lignin added to the epoxidized rubber vulcanization of a delay effect, can improve the mobility of mix, mix reduces the torque, and the amount, the more effect is more obvious. The amount of epoxidized HBS lignin component from 0 to 6.0 parts, of vulcanized rubber elongation increased from 601.73% to 1080.78%, but slightly lower tensile strength. The higher the curing temperature, curing time is shorter, but little change in the performance of vulcanized rubber. HBS lignin epoxidized more epoxy groups, anti-aging properties of vulcanized rubber as possible. Epoxidized neoprene HBS lignin solvent resistance, thermal stability is not affected.

SEM analysis showed that the addition epoxidized HBS lignin help other fillers dispersed in the rubber, the vulcanized rubber becomes soft, probably due to the epoxidized HBS lignin reacts with the rubber to produce a crosslinked structure. Experiments show that, HBS lignin with epichlorohydrin ratio of 1:4, the amount of 4.0 parts epoxide optimal performance when the rubber. Coprecipitated HBS lignin as a reinforcing agent in nitrile rubber (NBR). With the increase in the amount of the coprecipitate, the curing rubber compound becomes longer, the Mooney viscosity becomes large, may be due to lignin phenolic hydroxyl groups on the molecules methoxy constitute a hindered phenol structure. Add the amount of coprecipitate parts from 0 to 40 parts, the tensile strength of vulcanizates from 2.38Mpa to 13.82Mpa, elongation at break of 270% from up to 480%, indicating HBS lignin can be improved by adding sulfide adhesive performance. Coprecipitate coprecipitated ratio of 1:4, curing conditions of 160 °C × 2min best performance when the vulcanized rubber, with good resistance to aging, good reinforcing effect pine lignin. SEM images show that adding 30 parts of HBS lignin vulcanized rubber additives dispersed when the most evenly.

With the increase in the amount of lignin, vulcanized rubber apparent crosslink density increases. Gao HBS Lignin is a new type of rubber additives, there is a good prospect. This applied research HBS lignin opens up a new direction for the future, it is expected to be further promoted.