

## Development of Environmentally-friendly Rubber Plasticizer and Properties of It's Extended SBR

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**Abstract:** A new environmentally-friendly rubber plasticizer with high aromatic content was prepared using the third distillate of naphthenic base oil under vacuum as raw material. The aromatic and naphthenic contents were concentrated using hydrogenation method and solvent extraction process, in which the harmful polycyclic aromatic hydrocarbon was removed. Using the tread compound of high performance passenger car radial tire, the new plasticizer was then tested in SBR1763 and the compound was compared with aromatic oil extended SBR 1712 and treated distillate aromatic extract (TDAE) extended SBR1723. The testing results showed that the physical and chemical properties of SBR1763 and the physical properties of the vulcanized SBR1763 were similar to those of TDAE extended SBR1723.

**Keywords:** environmentally-friendly rubber plasticizer; oil extended SBR; tread compound; naphthenic oil; aromatic content

### 信息·资讯

## 万吨级智能化废轮胎再生橡胶集成技术通过鉴定

中胶橡胶资源再生(青岛)有限公司和青岛科技大学合作开发的环保节能型万吨级废轮胎再生橡胶连续化、模块化、智能化成套集成技术通过了中国循环经济协会组织的科技成果鉴定。该再生橡胶生产技术达到了万吨级规模,自动化、智能化程度高,配套完整,通过胶粒和胶粉制备模块、自动输送计量预处理模块、常压连续再生模块、高效多螺杆后处理模块、滤胶成型自动包装模块,加上DCS智能远程集中控制系统,不仅实现了生产连续化、清洁化、智能化,也实现了产品绿色化。产品多环芳烃含量小于 $100 \text{ mg} \cdot \text{kg}^{-1}$ ,门尼粘度[ML(1+4) 100 °C]为50~90,拉伸强度为9~12 MPa。

专家鉴定认为:该成果实现了万吨级智能化再生橡胶生产,完成了胶粒、胶粉到环保再生橡胶密闭连续化、模块化、清洁化的整套装

备技术的研发、设计和制造;实现了配料的均匀混合、渗透,为后续热化学再生工艺装备提供了支撑;在常压连续再生机上首次应用U形旋转机筒,耗能减小,清理方便,效率提高;应用精准定位加热技术,节能效果显著;新型柔性螺旋技术有效解决了设备易粘料、堵料、结块等行业技术难题;应用多螺杆加工技术实现了密闭连续化生产,生产环保、安全、产能大、效率高;首次在再生橡胶行业引入机械手操作;采用DCS控制系统,实现了系统的智能化,减少了生产定员,在生产过程中各项污染物的排放符合相关环境保护标准;自主研发了PAX系列环保再生软化剂、EEA系列环保再生活化剂、EEP系列环保多功能再生助剂;实现了装备技术、工艺技术、配合技术三位一体的开发和应用,产品环保指标符合欧盟REACH法规要求。

钱伯章