

3 结论

(1)随着增塑剂 DOP、DOS 或氯化石蜡用量的增大,CSM 胶料的门尼粘度下降, t_{10} 和 t_{90} 延长,交联程度降低;硫化胶的拉断伸长率增大,其他物理性能和耐热空气老化性能下降,氧指数呈减小趋势,耐低温性能提高。

(2)增塑剂 DOS 的增塑效果最好,增塑剂 DOP 次之,氯化石蜡最差。当增塑剂 DOS 用量为 40 份时,CSM 硫化胶在-55℃时的低温拉断伸长率达到 170%,达到了耐严寒的要求。

参考文献:

[1] 赵彦强,赵秀红,付愉,等. 氯磺化聚乙烯生产工艺技术分析

[J]. 化工科技,2004,12(3):52-57.

[2] Sandelin M J,Gedde U W. Long-term Performance of Cables Based on Chlorosulphonated Polyethylene[J]. Polymer Degradation and Stability,2004,86(3):331-338.

[3] Ekelund M,Fantoni P F,Gedde U W. Thermal Ageing Assessment of EPDM Chlorosulfonated Polyethylene Insulated Cables Using Line Resonance Analysis (LIRA)[J]. Polymer Testing,2011,30(5):86-93.

[4] 王作龄. 氯磺化聚乙烯配方技术[J]. 世界橡胶工业,2000,27(1):46-55.

[5] 李健,吴军,程树军. 氯磺化聚乙烯弹性体[J]. 弹性体,1997,7(1):38-42.

[6] 张丽芳,林新花,魏明勇,等. 新型环保增塑剂 RPL-1 在 ACM 中的应用[J]. 橡胶工业,2010,57(6):339-342.

收稿日期:2013-09-03

Application of Plasticizers in Chlorosulfonated Polyethylene Rubber

CHEN Xing-wu¹,LI Hai-quan²,XIE Xiang-qian²,ZOU Hua¹,TIAN Ming¹,WU Si-zhu¹

(1. Beijing University of Chemical Technology,Beijing 100029,China;2. Zhongtian Technology Industrial Wire &. Cable System Co. , Ltd.,Nantong 226010,China)

Abstract: The effects of plasticizer DOP,DOS and chlorinated paraffin on the properties of chlorosulfonated polyethylene rubber(CSM) were investigated. The results showed that,as the addition level of plasticizer increased,the Mooney viscosity of CSM compound decreased,the t_{10} and t_{90} were extended,the crosslinking degree decreased,the elongation at break of the vulcanizates increased,the other physical properties and thermal aging property decreased,the oxygen index tended to decrease,and the low temperature resistance was improved. DOS plasticized CSM vulcanizates showed the best low temperature resistance,while chlorinated paraffin plasticized CSM vulcanizates showed the smallest improvement. The CSM vulcanizates with 40 phr DOS met the application requirements in the severe cold conditions.

Key words: plasticizer;chlorosulfonated polyethylene rubber;low temperature resistance

用于耐臭氧耐低温密封圈的 丁腈橡胶/三元乙丙橡胶

中图分类号:TQ336.4+2;TQ333.4/.7 文献标志码:D

由天津鹏翎胶管股份有限公司申请的专利(公开号 CN 102260380A,公开日期 2011-11-30)“用于耐臭氧耐低温密封圈的丁腈橡胶/三元乙丙橡胶”,涉及的用于耐臭氧耐低温密封圈的丁腈橡胶(NBR)/三元乙丙橡胶(EPDM)配方为:NBR 70~90,EPDM 30~10,炭黑 N550

20~60,陶土 10~30,高苯乙烯 10~20,偶联剂 KH-550 2~12,硬脂酸 0.5~2,石蜡 1~3,增塑剂 DOP 10~30,相容剂 CPE 3~7,防老剂 MB 1~2,中和剂 TRA 0.5~1.5,交联剂 DCP 2~4,助交联剂 TMPTMA 0.5~1.5,助交联剂 TAIC 1~3。该发明改善了 NBR 耐臭氧性能和耐低温性能差、耐热温度范围较窄的缺点,拓宽了产品的使用温度范围。

(本刊编辑部 赵敏)