

(4) 旋转油封台架试验证明, 添加8份碳纳米管的旋转油封的使用寿命明显优于未添加碳纳米管的旋转油封, 且工作中温升较小。

#### 参考文献:

- [1] 李岩磊, 陆铭, 王永伟, 等. 碳纳米材料在橡胶材料中的应用研究进展[J]. 橡胶科技, 2018, 16(9): 5-10.
- [2] 刘剑洪, 吴双泉, 何传新, 等. 碳纳米管和碳微米管的结构、性质及其应用[J]. 深圳大学学报(理工版), 2013, 30(1): 1-11.
- [3] 张培亭, 高洪强, 肖建斌. 碳纳米管增强氢化丁腈橡胶的性能[J].

合成橡胶工业, 2017, 40(3): 202-206.

- [4] 袁兆奎, 赵鑫, 马文斌, 等. 碳纳米管补强丁腈橡胶的性能研究[J]. 橡胶工业, 2018, 65(3): 263-267.
- [5] 王彦, 段友顺, 于洋, 等. 炭黑和碳纳米管对丁腈橡胶性能的影响[J]. 橡胶工业, 2016, 63(9): 263-267.
- [6] 张晓辉, 黄兴, 向宇, 等. 碳纳米管在丁腈橡胶中的应用研究[J]. 润滑与密封, 2018, 43(8): 143-147.
- [7] 马明智, 向宇, 张晓辉, 等. 碳纳米管在氟橡胶旋转油封胶料中的应用[J]. 橡胶科技, 2018, 16(9): 28-31.

收稿日期: 2019-04-24

## Application of Carbon Nanotubes in Hydrogenated Nitrile Butadiene Rubber Sealing Products

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**Abstract:** The application of carbon nanotubes in hydrogenated nitrile butadiene rubber (HNBR) sealing products was studied. The results showed that, the amount of carbon nanotubes had little effect on the vulcanization properties of HNBR compound. As the amount of carbon nanotubes increased, the modulus at 100% elongation increased gradually and the elongation at break decreased, the hardness, tensile strength, tear strength and compression set decreased first and then increased, the aging resistance was improved, and the oil resistance and the  $\tan\delta$  of compound changed little. Under strain scanning, the  $\tan\delta$  of vulcanizates were highly correlated with its hardness. The service life of rotary oil seal with 8 phr carbon nanotubes using bench test was obviously prolonged, and the heat generation in work was small.

**Key words:** carbon nanotube; hydrogenated nitrile butadiene rubber; sealing product; rotary oil seal; service life

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(钱伯章)