

为冷拉伸的剪切屈服形成的,属典型的韧性断裂,从而导致共混体发生脆韧转变,冲击强度突然跃升。照片(c)共混体冲击断裂时形成的“须根”相互粘结成“须根”簇,这说明基体的塑性形变(即剪切屈服的程度)增大,导致冲击强度进一步提高。照片(d)冲击断面呈密集空穴化,这是由于 PMNR₂ 用量过大,配料在混炼过程中橡胶粒子相互粘结的趋向大,故形成的橡胶相粒径太大,非但不能引发剪切屈服,反而成为共混体的缺陷,在冲击断裂时被剥离形成空穴,故共混体的冲击断裂仍属脆性断裂,冲击强度很低。

扫描电镜分析证实,PVC/PMNR 共混体的增韧机理为典型的剪切屈服机理。

3 结论

(1)当预交联 NR 的溶胀指数为 14.5~10.9,乙烯基链的溶解度参数 δ 为 9.6 左右,乙烯基链质量分数为 0.25~0.35 时,

PMNR 对 PVC 的增韧效果显著。

(2)PMNR 对 PVC 有很高的增韧效果,PMNR 用量由 2.5 份增大到 5 份,共混体即发生脆韧转变,其冲击强度由 $5.1 \text{ kJ} \cdot \text{m}^{-2}$ 提高到 $64.3 \text{ kJ} \cdot \text{m}^{-2}$ 。

(3)扫描电镜分析表明,PMNR₂ 用量为 5~15 份时,共混体的冲击断面形貌为“须根”结构,其增韧机理属典型的剪切屈服机理。

参考文献

- 1 纳斯 L I. 聚氯乙烯大全(第二卷). 黄 锐,曾邦禄译. 北京:化学工业出版社,1985. 602~627
- 2 王炼石,蔡彤,吴向东,等. 粉末改性 SBR 对 PVC 的增韧作用. 塑料工业,1997,25(3):102~105
- 3 Wu Souheng. Phase structure and adhesion in polymer blend; a criterion for rubber toughening. Polymer, 1985, 26(12):1 855~1 863

收稿日期 1998-03-19

Toughening Effect of Modified NR Powder on PVC

Wang Lianshi, Gao Zhimei, Zhou Yiyu and Cai Tongmin

(South China University of Technology 510641)

Abstract The modified NR powder(PMNR) with the particle diameter less than 0.9 mm was blended with PVC to study the toughening effect of PMNR on PVC. The mechanical properties of the blends were investigated. It was found that the PMNR had notable toughening effect on PVC. The notched Charpy impact strength of the blend increased from $5.1 \text{ kJ} \cdot \text{m}^{-2}$ to $64.3 \text{ kJ} \cdot \text{m}^{-2}$ as the content of PMNR increased from 2.5 parts to 5 parts. The impact fractured surface morphology on SEM showed that the toughening mechanism of the blend was in accordance with that of the shear yielding.

Keywords PVC, modified NR powder, blend, toughening effect, impact strength

硅橡胶自粘带研制成功

一种可在工业领域广泛使用的产品——硅橡胶自粘带,最近由江苏省江阴市桐岐华鑫硅橡胶塑料厂研制成功。该自粘带是一种多用途的 H 级绝缘胶带,采用优质材料和先

进的工艺制成,具有耐腐蚀性强、自粘性好等特点,特别适用于高污染、高盐害及高热地区,广泛用于电力、钢铁、机械、化工等领域。目前,该产品已批量生产。

(摘自《中国化工报》,1998-03-25)