

Study on PEPA Endcapping Polyimide Resin/Glass Fiber Composite

Heng Zhang (张珩) Laiyan Bao Zixue Qiu (邱孜学)

Shanghai Research Institute of Synthetic Resins

Shanghai 200235 China

Abstract It is distinguished that PMR resins have good moulding performance and match well with glass fibers between their surfaces, but the NA endcapping mechanism offers low toughness and poor mechanical properties, which prevent the PMR resins from being produced into fixed parts in small-size and with high strength, so our work aims at modifying them to improve their toughness. The PEPA/BPDA/3,4'-ODPA/ODA system is adopted to synthesize n=4 resin (the resin whose number of repeated units is 4) and the PEPA/ODPA/ODA combination is also employed to synthesize n=1 resin (the resin whose number of repeated units is 1). The short-cut glass fibers

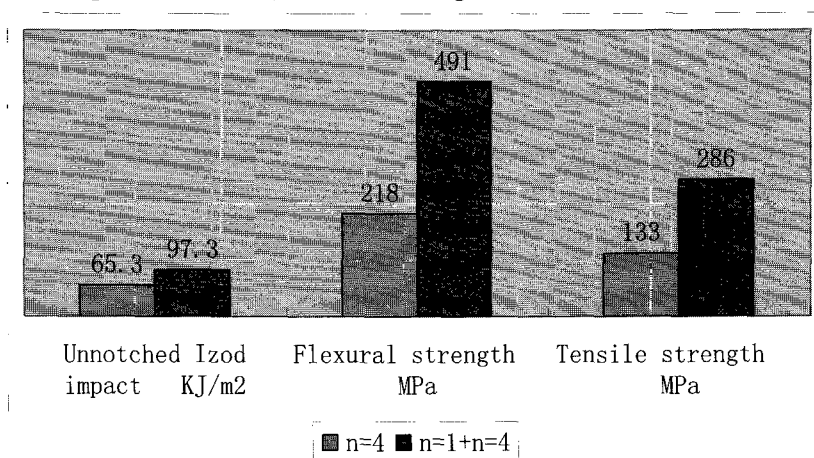


Figure 1. Average number of mechanical properties provided by two kinds of techniques

60-millimeter long are firstly infused by the n=1 resin and then tweaked with the n=4 resin (The mass percentage of glass fibers is 60%). The new polyimide composite prepregs are thermally moulded into slabs and then processed into specimens, providing a series of satisfactory property data:

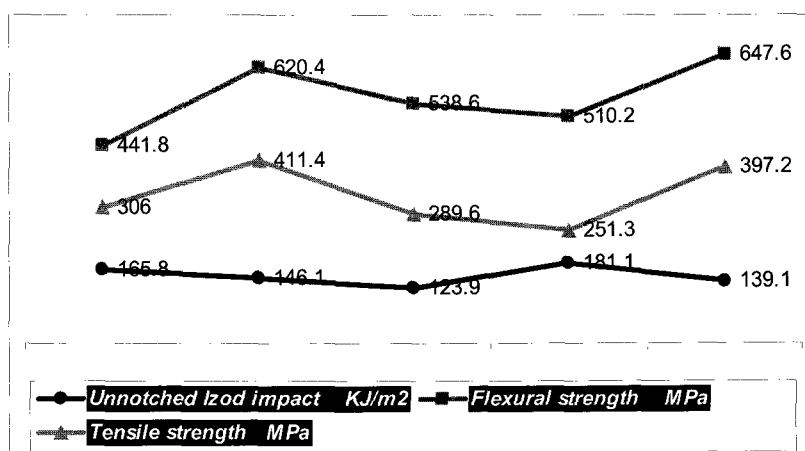


Figure 2. Mechanical properties' balance of specimens prepared by the new technique

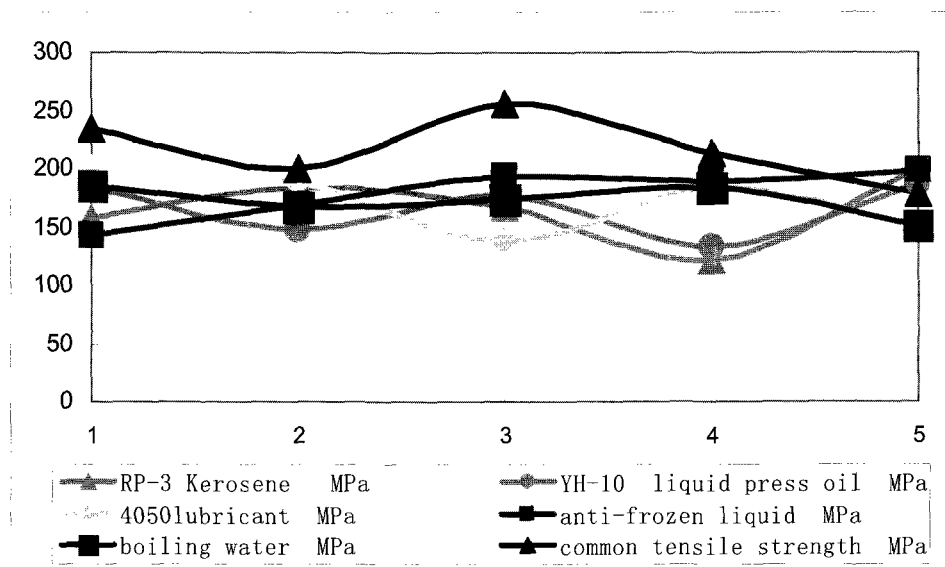


Figure 3. Tensile strength resistant to different solvents

From the figure above, we can arrive at these conclusions below:

1. It can effectively improve the saturation property between resin and fibers by tweaking the fibers with two resins having different molecular weight respectively.
2. The optimizing effect of the new technique is quite obvious, but the data are still not stable, implying that the tweaking step should be further stabilized.
3. Solvent resistance data of specimens prepared by the new technique is examined and the results are even satisfactory.



復旦大學 材料科学系

顏竹君 博士
副教授

上海市邯郸路220号
邮编: 200433
E-mail: cyen@fudan.edu.cn

电话: 021-55664576
传真: 021-55664576
手机: 15000245296



鄭州大學

材料科学與工程學院

博士 許群
教授

河南省鄭州市大學路75號 郵編: 450052
電話: 0371-67767827
傳真: 0371-67763561
電子郵箱: qunxu@zzu.edu.cn

ИЗОС A.N. Nesmeyanov Institute of Organoelement Compounds, Russian Academy of Sciences

Dr. Alexander S. Shaplov

PhD., senior scientific researcher

ionic liquids, high performance polymers, synthesis, polymer membranes, polyheteroarylenes, catalysis;

28 Vavilov str., Moscow
119991, GSP-1, RUSSIA

Phone 7-095-135-9244
Fax 7-095-135-5085
e-mail: zipper@ineos.ac.ru