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PROCESS AND PRODUCT TECHNOLOGY

油酸修饰纳米CaCO3/PP的结构与力学性能的研究

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在酸洗液 搅拌反应器 沉淀物洗涤 烘干过程 粉末状

摘要 **(Oro and OSC)**

modified CaCO3 nanoparticles were prepared using surface modification method. Infrared spectroscopy (IR) was used to investigate the structure of the modified CaCO3 nanoparticles, and the result showed that OA attached to the surface of CaCO3 nanoparticles with the ionic bond. Effect of OA concentration on the dispersion stability of CaCO3 in heptane was also studied, and the result indicated that modified CaCO3 nanoparticles dispersed in heptane more stability than unmodified ones. The optimal proportion of OA to CaCO3 was established. The effect of modified CaCO3 nanoparticles on crystallization behavior of polypropylene (PP) was studied by means of DSC. It was found that CaCO3 significantly increased the crystallization temperature, crystallization degree and crystallization rate of PP, and the addition of modified CaCO3 nanoparticles can lead to the formation of β-crystal PP. Effect of the modified CaCO3 content on mechanical properties of PP/CaCO3 nanocomposites was also studied. The results showed that the modified CaCO3 can effectively improve the mechanical properties of PP. In comparison with PP, the impact strength of PP/CaCO3 nanocomposites increased by about 55% and the flexural strength increased by about 20%.

关键词 **oleic acid modified; using CaCO3; oleic acid; crystallization; mechanical properties.**

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Effect of oleic acid modified nano CaCO3 on the crystallization behavior and mechanical properties of polypropylene

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Abstract Oleic acid (OA) modified CaCO3 nanoparticles were prepared using surface modification method. Infrared spectroscopy (IR) was used to investigate the structure of the modified CaCO3 nanoparticles, and the result showed that OA attached to the surface of CaCO3 nanoparticles with the ionic bond. Effect of OA concentration on the dispersion stability of CaCO3 in heptane was also studied, and the result indicated that modified CaCO3 nanoparticles dispersed in heptane more stably than unmodified ones. The optimal proportion of OA to CaCO3 was established. The effect of modified CaCO3 nanoparticles on crystallization behavior of polypropylene (PP) was studied by means of DSC. It was found that CaCO3 significantly increased the crystallization temperature, crystallization degree and crystallization rate of PP, and the addition of modified CaCO3 nanoparticles can lead to the formation of β-crystal PP. Effect of the modified CaCO3 content on mechanical properties of PP/CaCO3 nanocomposites was also studied. The results showed that the modified CaCO3 can effectively improve the mechanical properties of PP. In comparison with PP, the impact strength of PP/CaCO3 nanocomposites increased by about 55% and the flexural strength increased by about 20%.

Key words **oleic acid modified; using CaCO3; oleic acid; crystallization; mechanical properties.**

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