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The effect of polyhedral oligomeric silsesquioxanes supported α-nucleating agent on the properties of isotactic polypropylene

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In this paper, the nucleating agent supported on the surface of polyhedral oligomeric silsesquioxanes (POSS) was prepared and its effect on the properties of isotactic polypropylene (iPP) was investigated. The reduced sizes of α-nucleating agent (NA-40) were proved using scanning electron microscopy and energy dispersive X-ray spectroscopy. The nucleating efficiency of NA-40 was investigated via analyzing the mechanical properties and crystallization behavior of polypropylene. It is found that the flexural modulus of iPP increases by 11.6 % with the addition of 0.04 wt. % NA-40 alone and increases by 23.3 % when the same content of NA-40 support on octamethylsilsesquioxane (OMS). Especially, using OMS as the support will not determine the optical properties of polypropylene because of the compatibility between OMS and iPP. Moreover, due to the existence of OMS, the toughness of the system will not decrease compared to add with NA-40 alone. The results of investigation showed that the supported α-nucleating agent prepared by supporting NA-40 on OMS exhibited higher nucleation ability compared to commercial NA-40 powder.

Biography

Xian Zhang has completed his Bachelor's degree from Qingdao University of science and technology when she was 21 years old. In 2017, she entered East University of science and technology (China) to study for a doctor's degree. Currently, she is engaged in the application of polyhedral oligomeric silsesquioxanes.

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