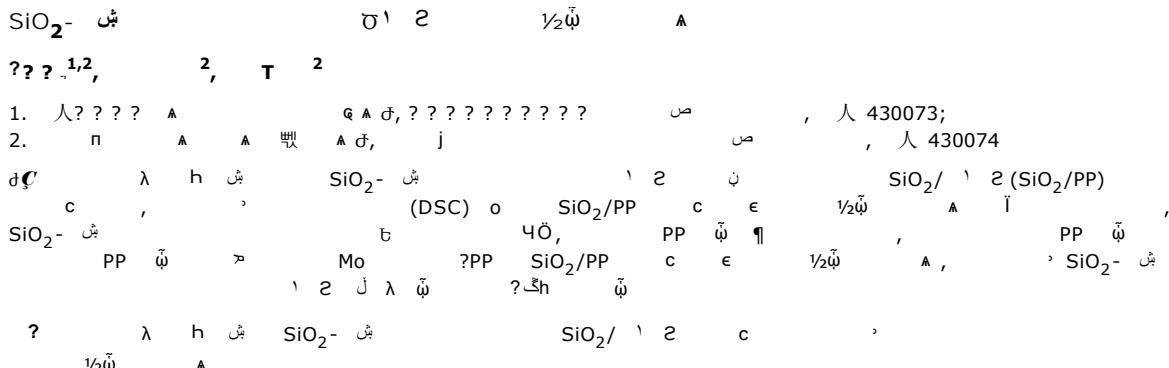


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Non-isothermal crystallization kinetics of polypropylene containing silica hybrid particles as fillers

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Abstract: By means of in situ emulsion copolymerization, core-shell silica hybrid particles with poly(MMA-co-BA) shells were fabricated, which were subsequently compounded with isotactic polypropylene (PP) in the molten state to prepare SiO₂/PP composites. The non-isothermal crystallization kinetics of SiO₂/PP composites was investigated by DSC. The results show that the addition of silica hybrid particles has an obvious nucleating effect on the crystallization of PP, increasing crystallization temperature and crystallization rate. On the contrary, the activation energies of SiO₂/PP are higher than that of the pure PP. The kinetics of non-isothermal crystallization of SiO₂/PP can be indicated by Mo equation. It shows that silica hybrid particles decrease the cooling rates of PP needed to reach relative crystallinities in a unite time.

Keywords: *in situ* emulsion copolymerization silica-polymer hybrid particles SiO₂/polypropylene composites DSC
non-isothermal crystallization kinetics

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