Development of Insulating Nanoparticle and its Application in Food Packaging for the freshness of Home Meal Replacement

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Home meal replacement (HMR) is growing rapidly with single-person households and dietary changes. However, the current HMR container is not able to effectively block the external heat to maintain the freshness of the food. In this study, insulating particles were synthesized and applied to HMR food containers. It was confirmed that the thermal conductivity is effectively blocked by analyzing the thermal conductivity while the insulating particles are coated or uncoated. The adiabatic particles developed in this study have a capsule structure, which makes the liquid core stable. Their thermal stability was evaluated by thermogravimetric analysis(TGA). The polymeric composites were coated on Polypropylene(PP) with the insulating nanoparticles by Bar coater. The content of dodecane contained in nanoparticles capsules was confirmed by TGA analysis. The latent heat of nanoparticles and the polymeric composites were also measured by differential scanning calorimetry(DSC) analysis.