Suspension polymerization of thermally expandable microspheres using low-temperature initiators

소재일, 임미정, 천영걸, 하진욱[1], 심상은†
인하대학교; [1]자동차 부품 연구원
(seshim@inha.ac.kr†)

Thermally expandable microspheres with core-shell structure have a lot of industrial application. The microspheres which have the typical diameter of 5 – 50 μm can be expanded to microballoons with 50 – 100 times larger volume.
In this study, thermally expandable microspheres are synthesized with acrylonitrile(AN) and methyl methacrylate(MMA) . N-octane is used the blowing agent. Suspension polymerization of AN and MMA in water are stabilized by PVP. BDDMA is used as crosslinker. AIBN, V-70, V-65 V-59 are used as the initiator. When the V-70 is used, the microspheres are made at low temperature. V-70 initiator which has low decomposition temperature is the most suitable to prepare the stable microcapsules with particle size of 20-30 μm. The stable capsules without destruction of particles could be obtained. When the initiator amount is 1.5 wt.% and the pressure is 3 bar , the particle size is 30.16 μm and the encapsulation of n-octane is 40 %. The particles expand at 156 °C.

Acknowledgments
This work was supported by a grant (1415140208/10045051) Korea Ministry of Trade, Industry and Energy (MOTIE), Republic of Korea (2015)