

## **Study on Melt Spinning of Shaped Hollow Polypropylene Fibers**

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**Abstract:** Influences of polymer and processing parameters on melt spinning, features, and structures of circular and triangular shaped hollow fibers were investigated. Spinnability of triangular hollow fibers was found to be more sensitive to polymer viscosity and processing conditions than that of circular hollow counterparts such that fiber breakage occurred when polypropylene with high viscosity was employed. Relatively low temperature due to high cooling at tip of triangular shape may cause stress concentration developed in spin-line, and lead to fiber breakage. Increasing temperature enabled continuous spinning in triangular hollow fibers. The obtained triangular hollow fibers possessed slightly larger diameters but smaller percent hole areas, compared to the circular ones. Results showed that diameters and percent hole areas of both circular and triangular hollow fibers tended to decrease with increasing spinning temperature and take up velocity, but tended to increase with increasing throughput rate. From WAXD results, crystalline orientation in hollow fibers was found affected by take up velocity, and slightly by fiber configuration.

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