

# The effect of residence time on the physical characteristics of PAN-based fibers produced using a solvent-free coagulation process

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Received 8 August 2006; accepted 16 October 2006

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## Abstract

The paper reports the fabrication and characterizations of PAN fibers fabricated using residence time in the range of 2–5 s in the solvent-free coagulation process. The PAN fibers were characterized using SEM, FTIR-ATR and tensile testing. The SEM photographs revealed that the cross-section of PAN fiber for all samples were free from large voids. A residence time of 3 s was found to be the most suitable residence time for fabricating the PAN fibers in the solvent-free coagulation bath. FTIR-ATR data suggest that the PAN fibers possessed better molecular orientation and exhibited the highest Young's modulus of 2.55 GPa.

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*Keywords:* PAN fibers; Solvent-free coagulation process; Residence time; Molecular orientation; Mechanical properties

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