

Accepted Manuscript

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PII: S0142-9418(17)30810-3

DOI: [10.1016/j.polymertesting.2017.07.032](https://doi.org/10.1016/j.polymertesting.2017.07.032)

Reference: POTE 5136

To appear in: *Polymer Testing*

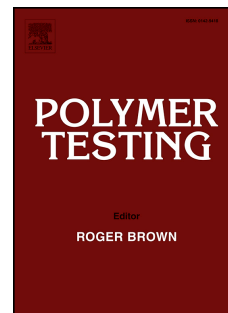
Received Date: 19 June 2017

Revised Date: 24 July 2017

Accepted Date: 27 July 2017

Please cite this article as: F. Chen, H. Ou, S. Gatea, H. Long, Hot tensile fracture characteristics and constitutive modelling of polyether-etherketone (PEEK), *Polymer Testing* (2017), doi: 10.1016/j.polymertesting.2017.07.032.

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Hot tensile fracture characteristics and constitutive modelling of polyether-ether-ketone (PEEK)

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ABSTRACT

The effects of strain rate and deformation temperature on the deformation behaviors of polyether-ether-ketone (PEEK) were studied by uniaxial tensile tests with the temperature range of 23-150 °C and strain rate of 0.01-1 s⁻¹. The effects of deformation temperature and strain rate on the hot tensile deformation behavior and fracture characteristics were investigated by scanning electron microscope (SEM) and discussed in detail. SEM experimental results suggest that fracture morphology is not strain rate sensitive but temperature sensitive. Based on the tensile results, the Johnson-Cook and modified Johnson-Cook constitutive models were established for PEEK. Furthermore, a comparative study has been made on the accuracy and effectiveness of the developed models to predict the flow stress. The results show that the original Johnson-Cook model reflects the deformation behavior more

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