Contribution ID: **51** Type: **Poster**

Post-treatment methods of semiconducting polymer films and investigation of the influence on thermoelectric properties

Tuesday, 25 June 2019 16:15 (1 hour)

The constantly increasing energy demand raises the need for renewable energies and the reduction of energy dissipation. Thermoelectric materials are of great interest in terms of waste heat recovery and the use of solar thermal energy, as they enable the direct conversion of a temperature gradient into electrical power. In particular, thermoelectric polymers are attractive, as they own some advantages over inorganic thermoelectric materials, such as low cost, high mechanical flexibility, low or no toxicity, lightweight and intrinsically low thermal conductivity. A typical way to evaluate thermoelectric properties is the power factor PF=S2⍰. This parameter depends on the Seebeck coefficient S and the electrical conductivity ⍰, which are affected by the electronic and morphological features of the polymer. In order to investigate ways to influence these features and improve the values S and ⍰, we fabricate thin semi-conducting polymer films and post-treat them in different ways. With measurements of parameters such as S, ⍰, absorbance, layer thickness and determination of the structure, we investigate the morphology-function relation.

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Session Classification: Poster session