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## Comparative photovoltaic properties of novel thiophene and selenophene-based conjugated low bandgap polymers

Min Sup Kim and In Tae Kim  
Kwangwoon University, South Korea

In this study, we investigated the photovoltaic properties of newly synthesized low bandgap conjugated polymers, poly(4-(4,8-bis(5-(2-ethylhexyl)thiophen-2-yl)benzo[1,2-b:4,5-b0]dithiophen-2-yl)-8-(5-(2,6-didodecylbenzo[1,2-d:4,5-d0]bis(thiazole)-4-yl)thiophen-2-yl)-2,6-didodecylbenzo[1,2-d:4,5-d0]bis(thiazole)(P1) and poly(4-(4,8-bis(5-(2-ethylhexyl)thiophen-2-yl)benzo[1,2-b:4,5-b0]dithiophen-2-yl)-8-(5-(2,6-didodecylbenzo[1,2-d:4,5-d0]bis(thiazole)-4-yl)selenophen-2-yl)-2,6-didodecylbenzo[1,2-d:4,5-d0]bis(thiazole)) (P2). P1 is a thiophene-based conjugated polymer (TCP) and P2 is a selenophene-based conjugated polymer (SCP). These two different conjugated low bandgap polymers were characterized by NMR and gel permeation chromatography. The physical properties of the polymers were studied by thermogravimetric analysis and conductivity. Moreover, we also investigated the optical, electrochemical and morphological properties of both polymers by UV-vis spectroscopy, cyclic voltammetry and atomic-force microscopy (AFM), respectively. Later, we studied the photovoltaic properties of both low bandgap polymers blended with PC61BM in different ratios with different thicknesses. In addition, post thermal annealing at different temperature for both polymers was investigated and the results showed that P2 (SCP) exhibited stronger molecular orientation properties as compared to P1 (TCP).

### Biography

Min Sup Kim has completed his Undergraduate studies at Kwangwoon University, Department of Chemistry. He is currently working on Master's degree at Kwangwoon University and majoring in Polymer Chemistry.

minsup954@gmail.com

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