

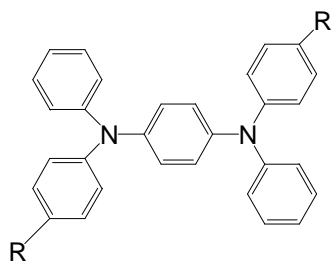
Electrochemical and Spectral Studies on the *N,N,N',N'*-  
Tetraaryl-*p*-Phenylenediamines

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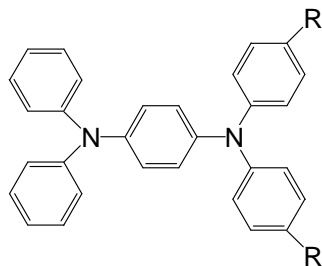
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Several tetraaryl-*p*-phenylenediamine derivatives (Figure 1) with various electron donating and electron-withdrawing substituents have been synthesized and their spectral and electrochemical characteristics have been investigated. According to the molecular symmetry, tetraaryl-*p*-phenylenediamines are grouped as two series. The derivatives exhibited similar electrochemical characteristics and their oxidation potentials are related to the types of substituents and the positions where they are substituted. The stability of the oxidation products were monitored with UV/VIS/NIR spectroelectrochemical investigations. The HOMO/LUMO energy levels for the tetraaryl-*p*-phenylenediamine series were estimated. The tetraaryl-*p*-phenylenediamine series showed their potentials as the hole-transporting molecules owing to their suitable energy levels and great stability after oxidation.

Figure 1. Chemical structure of the tetraaryl-*p*-phenylenediamine compounds in this study.



Series 1  
NPD1, R = NO<sub>2</sub>  
CPD1, R = CN  
MPD1, R = OCH<sub>3</sub>  
APD1, R = NH<sub>2</sub>



Series 2  
NPD2, R = NO<sub>2</sub>  
CPD2, R = CN  
MPD2, R = OCH<sub>3</sub>  
APD2, R = NH<sub>2</sub>

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