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The effect of EWG and EDG on the HOMO and LUMO levels of Alq3.

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Abstract content
   (Max 300 words)

Tris-(8-hydroxyquinoline) aluminium (Alq3) is used as both the emission and electron transporting layer in organic light emitting diodes (OLEDs). One way to tune the emissive colour of Alq3 is to introduce electron-withdrawing and electron-donating groups (EWG and EDG) onto the hydroxyquinoline ligands. These groups will have an effect on the energy gap between the highest occupied molecular orbital (HOMO) and the lowest unoccupied molecular orbital (LUMO). In this study Alq3 powders were synthesized with an EDG (-CH3) substituted at position 5 and 7 ((5,7-dimethyl-8-hydroxyquinoline) aluminium) and EWG (-Cl) at position 5 ((5-chloro-8-hydroxyquinoline) aluminium). Absorption and photoluminescence spectra were measured for the different samples and a red shift were observed for both 5,7Me-Alq3 and 5Cl-Alq3. The optical band gap calculated using Tauc's relation and the absorption data showed that there was a decrease in the bandgap of 0.3 - 0.5 eV. Cyclic voltammetry (CV) were performed on the samples. The HOMO levels of 5,7Me-Alq3 and 5Cl-Alq3 showed a bathochromic shift with respect to Alq3.

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Yes

Level for award
 (Hons, MSc,
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PhD

Main supervisor (name and email)
and his / her institution

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Would you like to <br> submit a short paper <br> for the Conference
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yes

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