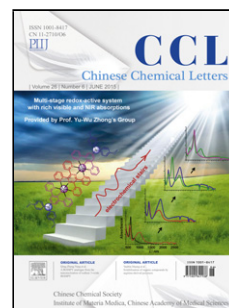


## Accepted Manuscript

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Communication

## Dipole and charge effects of chloroaluminum phthalocyanine revealed by local work function measurements at sub-molecular level

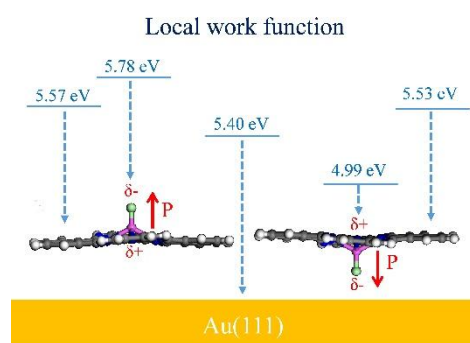
Huanjun Song,<sup>a</sup> Na Li,<sup>b</sup> Hao Zhu,<sup>a</sup> Zhantao Peng,<sup>a</sup> Wenhui Zhao,<sup>a</sup> Haoran Chen,<sup>a</sup> Wei Chen,<sup>c</sup> Yongfeng Wang<sup>b\*</sup>, Kai Wu<sup>\*a</sup>

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Graphical abstract



Chloroaluminum phthalocyanine (CIAIPc), an important optoelectronic molecule with a permanent dipole moment pointing from the Pc ring to the ending Cl atom, adsorbed on Au(111) in either Cl-up or Cl-down configuration. Scanning tunneling microscopy/spectroscopy measurements revealed that at the centers of Cl-up and Cl-down molecules, the local work functions changed oppositely with respect to the Au(111) substrate. At their Pc lobes, however, the local work functions unanimously increased due to charging effect of the indole lobes in the CIAIPc molecule.

**ABSTRACT** Work function plays a significant role in surface chemistry. Local work function provides the information of local dipole-dipole interaction and charge distribution between adsorbates and substrate, highlighting the local charge effect of the targeted spot which is normally smeared out in conventional average work function measurements. Chloroaluminum phthalocyanine (CIAIPc), an important optoelectronic molecule with a permanent dipole moment pointing from the Pc ring to the ending Cl atom, adsorbed on Au(111) in either Cl-up or Cl-down configuration. Scanning tunneling microscopy/spectroscopy measurements revealed that at the centers of Cl-up and Cl-down molecules, the local work functions changed oppositely with respect to the Au(111) substrate. At their Pc lobes, however, the local work functions unanimously increased due to charging effect of the indole lobes in the CIAIPc molecule.

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