

Accepted Manuscript

Title: Charge transfer between transition metal phthalocyanines and metal substrates: The role of the transition metal

Author: Heiko Peisert Johannes Uihlein Fotini Petraki
Thomas Chassé



PII: S0368-2048(15)00017-1
DOI: <http://dx.doi.org/doi:10.1016/j.elspec.2015.01.005>
Reference: ELSPEC 46385

To appear in: *Journal of Electron Spectroscopy and Related Phenomena*

Received date: 19-12-2014
Revised date: 15-1-2015
Accepted date: 19-1-2015

Please cite this article as: H. Peisert, J. Uihlein, F. Petraki, T. Chassé, Charge transfer between transition metal phthalocyanines and metal substrates: The role of the transition metal, *Journal of Electron Spectroscopy and Related Phenomena* (2015), <http://dx.doi.org/10.1016/j.elspec.2015.01.005>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Charge transfer between transition metal phthalocyanines and metal substrates: The role of the transition metal

Heiko Peisert,* Johannes Uihlein, Fotini Petraki and Thomas Chassé

Institute of Physical and Theoretical Chemistry, University of Tübingen, Auf der Morgenstelle 18, 72076 Tübingen, Germany

Abstract

We review the interaction mechanism of transition metal phthalocyanines (TMPcs, TM = Mn, Fe, Co) on different metal substrates (Au, Ag, Ni). The interface to Ni is further modified by the introduction of a graphene intermediate layer. Although TMPcs are representatives for flat, π -conjugated carbon systems, their electronic properties are determined to a large extent by the central metal atom. We focus on the role of the central metal atom in interfacial charge transfer processes. On single crystalline metal substrates the molecules grow highly ordered with flat lying adsorption geometry. We focus on studies using photoexcited electron spectroscopies: Photoemission and X-ray absorption spectroscopy (XAS or NEXAFS). The highly ordered growth of TMPcs supports the assignment of polarization dependent XAS features. Depending on both the substrate and the TMPc, the strength of the interaction reaches from weak physisorption to strong chemical interactions. The introduction of graphene buffer layers seems to be a promising route for the tuning of interface properties.

Keywords

organic semiconductors, phthalocyanines, interfaces, charge transfer, photoemission, X-ray absorption spectroscopy

Highlights

- Charge transfer involving the central metal atom of the TMPc occurs at many interfaces.
- Strong interactions on Ag(111) and Ni(111) are accompanied by the formation of interface states.
- Interface properties can be tuned by graphene as an intermediate layer.

* Corresponding author, heiko.peisert@uni-tuebingen.de, phone: +49 7071 2976931

Download English Version:

<https://daneshyari.com/en/article/5395595>

Download Persian Version:

<https://daneshyari.com/article/5395595>

[Daneshyari.com](https://daneshyari.com)