

稀土酞菁配合物的XPS研究

李振祥,谢云芬,倪嘉缙

中国科学院稀土化学与物理开放实验室

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摘要 本文合成了一系列稀土单酞菁配合物Lnpc(OAc)2,和Lnpccl(Ln=Tb,Ho, Tm, Lu,Pc为酞菁根, OAc为乙酸根)并用XPS较详细地研究了它们的电子结构, 讨论了它们的化学键性质和组成。

关键词 酞花青 P 氯化物 元素分析 X射线光电子谱法 化学键 稀土金属络合物 电子结构 钛络合物 乙酸 P 铈络合物 镨络合物 铽络合物

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XPS study on rare earth phthalocyanine complexes

LI ZHENXIANG,XIE YUNFEN,NI JIAZUAN

Abstract LnPcCl and Ln(HPc)(OAc)2 (Ln = Tb, Ho, Tm, Lu, H2Pc = phthalocyanine) were synthesized. Their electronic structures were studied by XPS. The experimental results of binding energies for the complexes indicate that the bonds of the complexes have a certain covalent character depending on L ?Ln charge transfer. This L ?Ln charge transfer process of phthalocyanine complexes differs from that of crown ether complexes. Both coordination and substitution are included in the former case, but only coordination in the latter. Phthalocyanine ring is an electrophilic group and its electronegativity is large. So, the O 1s binding energies of coordinating O atoms of acetate in LnPc(OAc)2 are larger than those of Ln(OAc)3. The magnitude of valent charge delocalized from ligand onto metal atom is dependent on electronegativity, coordination no., valence state, etc. Because coordination no. of Ln in Ln(HPc)(OAc)2 is larger than that in LnPcCl and electronegativity of Cl in LnPcCl is larger than that of O in Ln(HPc)(OAc)2, the Ln 4d5/2 binding energies of Ln(HPc)(OAc)2 are less than those of LnPcCl.

Key words PHTHALOCYANINE P CHLORIDE ELEMENTAL ANALYSIS X-RAY PHOTOELECTRON SPECTROMETRY CHEMICAL BONDS RARE EARTH METAL COMPLEX ELECTRONIC STRUCTURE TITANIUM COMPLEX ACETIC ACID P THULIUM COMPLEX LUTETIUM COMPLEX TERBIUM COMPLEX

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