

Synthesis and characterization of monomeric and polymeric Pd(II) and Pt(II) complexes of 3,4-ethylenedioxythiophene-functionalized phosphine ligands

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Abstract

Phosphine ligands bearing 3,4-ethylenedioxythiophene (EDOT) groups, in which a Ph₂P group is either connected directly to the thiophene ring [Ph₂P(5-EDOT), **1**] or to the EDOT ethylenebridge *via* a methylene (**4**) or longer (**7**) 'spacer', have been prepared, together with their complexes *cis*-[MCl₂(L)₂] (M = Pd and Pt). The electrochemical co-polymerization of the complexes with EDOT was investigated, with a view to making conducting polymers incorporating covalently-bound metal-phosphine complexes. Although polymer-coated electrodes were obtained in all experiments, XPS measurements established that polymers made in the presence of *cis*-[MCl₂(**1**)₂] consisted only of poly(3,4-ethylenedioxythiophene) (PEDOT), whereas polymers made in the presence of *cis*-[MCl₂(L)₂] (L = **4**, **7**) were genuine co-polymers containing Pd(II) or Pt(II) complexes.