

**13C, 15N and 31P NMR study of the disproportionation of cyanogold(I) complexes: [R3PAu13C15N].** Isab, Anvarhusein A.; Hussain, M. Sakhawat; Akhtar, M. Naseem; Wazeer, M. I. M.; Al-Arfaj, A. Rahman. Department of Chemistry, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia. Polyhedron (1999), 18(10), 1401-1409.

### **Abstract**

The disproportionation of cyanogold(I) complexes [R3PAu13C15N] forming [(R3P)2Au]+ and [Au(13C15N)2]- ions was studied using 13C, 15N and 31P NMR spectroscopy for phosphines with R = cyclohexyl, i-Pr, Et, Me, cyclohexyl/diphenyl, o-tolyl, p-tolyl, m-tolyl, p-tolyl/diphenyl, allyl/diphenyl, Ph, tri(cyanoethyl) (CEP), and 1-naphthyl. The 13C NMR of the 13C15N group in these complexes exhibited two distinct resonances, one due to 13C in the starting [R3PAu13C15N] complex and the 2nd from the [Au(13C15N)2]- anion. The 31P NMR spectra revealed two 31P resonances due to the [R3PAu13C15N] complex and the [(R3P)2Au]+ cation. The 15N NMR revealed only an averaged resonance due to [R3PAu13C15N] and [Au(13C15N)2]- anion, except in the cases of [Me3PAu13C15N] and [Et3PAu13C15N] where two resonances were obsd. The coupling consts., 1J(13C-15N), 2J(31P-13C) and 3J(31P-15N) were obtained for all complexes and the free energies of activation for ligand disproportionation were detd. using 31P-{1H} NMR band shape anal.