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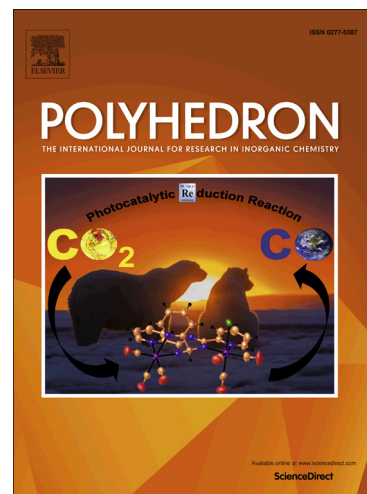
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# The hydridotris(3-nitro-1,2,4-triazol-1-yl)borate, a new nitro-substituted electron withdrawing polydentate “scorpionate”-type ligand and related copper and silver phosphane complexes

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## Abstract

The new tripodal “scorpionate”-type ligand, the sodium hydridotris(3-nitro-1,2,4-triazol-1-yl)borate Na[HB(tz<sup>NO2</sup>)<sub>3</sub>] (**1**), containing electron withdrawing nitro functional groups on the azolyl moiety, has been synthesized in high yield starting from 3-nitro-1,2,4-triazole and sodium borohydride. New copper(I) and silver(I) complexes, [HB(tz<sup>NO2</sup>)<sub>3</sub>]M(PR<sub>3</sub>)<sub>2</sub> (M = Cu or Ag; PR<sub>3</sub> = P(C<sub>6</sub>H<sub>5</sub>)<sub>3</sub>, or P(*p*-C<sub>6</sub>H<sub>4</sub>CH<sub>3</sub>)<sub>3</sub>) have been synthesized from the reaction of CuCl or AgNO<sub>3</sub> with Na[HB(tz<sup>NO2</sup>)<sub>3</sub>] and triphenylphosphane or tri(*p*-tolyl)phosphane, respectively. These compounds have been characterized by elemental analyses, FT-IR, ESI-MS and multinuclear NMR spectroscopy. X-ray crystal structure of Na[HB(tz<sup>NO2</sup>)<sub>3</sub>] (**1**) shows that it has polymeric network structure resulting from sodium atoms of tripodal Na[HB(tz<sup>NO2</sup>)<sub>3</sub>] forming inter-molecular Na-N bonds to three nitrogen atoms of three neighboring triazolyl moieties of Na[HB(tz<sup>NO2</sup>)<sub>3</sub>]. Each sodium center has distorted octahedral geometry with three short Na-N (inter-molecular) and three long Na-N bonds (to chelating N-atoms of [HB(tz<sup>NO2</sup>)<sub>3</sub>] ligand). This nitro-substituted scorpionate ligand could be of interest due to its high coordinative flexibility from endo- to exo-polydentate coordination mode.

**KEYWORDS.** Silver(I); Copper(I); Chelate ligands; Scorpionates; X-ray; Phosphanes; Spectroscopy

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