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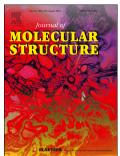
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Linear hexanuclear nickel complexes with rich electrochemical features

and facility to reduction

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Abstract: Two novel linear hexanuclear nickel complexes $[Ni_6(\mu_6-dpznda)_4Cl_2](PF_6)_2$ (1) and $[Ni_6(\mu_6-dpznda)_4(NCS)_2](PF_6)_2$

(2)

(H₂dpznda

=

 N^2 , N^7 -di(pyrazin-2-yl)-1,8-naphthyridine-2,7-diamine) were synthesized and structurally characterized. Both the two complexes consist of a linear metal chain and four supporting ligands which are helically wrapped around the metal core. The single crystal X-ray structural analysis showed that the complex 1 belonged to rhombohedral system, space group R-3 with a = b =34.2051(8), c = 20.7751(5) Å, V = 21050.2(9) Å³ and Z = 9. Direct-current magnetic susceptibility measurements showed weak antiferromagnetic interactions with coupling parameters of g = 2.04and $J = -8.27 \text{ cm}^{-1}$ for **1** and g = 2.02 and $J = -12.62 \text{ cm}^{-1}$ for **2**, respectively ($\hat{H} = -J\hat{S}_1\hat{S}_2$, $S_1 = S_2$ = 1). The decrease of magnetic moments at low temperature was partly attributed to ZFS. The electrochemical study on complex 1 shows rich features and facility to reduction in its cyclic voltammogram by displaying four reversible redox couples at $E_{1/2} = +0.01, -0.29, -0.64$ and -0.73V (vs. Ag/AgCl).

Keywords: Metal string compounds; Hexanuclear nickel complex; Extended metal atomic chains; Electrochemical features; Magnetic property

1. Introduction

Linear metal string complex, also named as EMACs (extended metal atomic chains), is a kind of polynuclear complexes with metal-metal interaction, which shows unique electromagnetic properties and prospective applications of molecular electronics.[1] Increasing attention has been paid to linear metal string complexs, especially Download English Version:

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