CRYSTAL STRUCTURE OF BIS(4,4'-BIPYRIDINE)ZINC(II) SUCCINATE

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Figure 1. ORTEP plot of the title complex at the 50% probability level. Selected bond distances and angles: Zn1-O1 = 2.064(2), Zn1-O2 = 2.317(2), Zn1-N1 = 2.106(2) Å; O1-Zn-O1ⁱ = 154.9(1), O1-Zn-O2 = 59.7(1), O1-Zn-O2ⁱ = 101.5(1), O1-Zn-N1 = 96.4(1), O1-Zn-N1ⁱ = 100.3(1), N1-Zn-N1ⁱ = 96.4(1), N1-Zn-O2 = 155.9(1), N1-Zn-O2ⁱ = 91.5(9), O2-Zn-O2ⁱ = 90.5(1)°. Symmetry transformation: *i* = -*x*, *y*, 0.5 - *z*.

Table 1. Crystal data for 4,4'-bipyridinezinc(II) succinate

Empirical formula	C ₂₄ H ₂₀ N ₄ O ₄ Zn	Formula weight	493.81
Crystal system	Monoclinic	Space group	C2/c
Unit cell dimensions	<i>a</i> = 18.877(10)	β	125.99(1)°
	<i>b</i> = 9.915(9)	Volume	2238(2) Å ³
	<i>c</i> = 14.776(5) Å	<i>Z</i>	4
Density, Mg m ⁻³	1.466	μ , mm ⁻¹	1.136
<i>F</i> (000)	1016	θ range of data	2.5 - 27.0°
Index ranges	0 ≤ <i>h</i> ≤ 24, 0 ≤ <i>k</i> ≤ 12, -18 ≤ <i>l</i> ≤ 15	Reflections collected	2440
Independent reflections	1855 (<i>R</i> _{int} = 0.039)	Completeness of data	99.6%
Refinement method	Full-matrix least-squares on <i>F</i> ²	Data / parameters	2440/150
<i>w</i>	[$\sigma^2 + (0.0547P)^2 + 1.9454P$] ⁻¹	<i>R</i> (all data)	0.096
Goodness-of-fit on <i>F</i> ²	1.02	Final <i>R</i> [<i>I</i> > 2 σ (<i>I</i>)]	0.039
Programs	SHELXS-97, SHELXL-97, XSCANS, ORTEP [8-11]	Diff. hole and peak, eÅ ⁻³	-0.23 - 0.28
		CCDC deposition no.	162192

Comment

The 4,4'-bipyridine ligand is extensively used to bridge metal atoms in the formation of one-, two- and three-dimensional structures [1-6]. Among their zinc(II) complexes, several monocarboxylate complexes of this heterocyclic *N*-donor ligand adopt one-dimensional chain structures. Few dicarboxylates have been examined [7]. Curiously, the potentially bridging heterocycle is linked to the metal atom through only one of the nitrogen ends in the title compound; the metal atom is chelated by the carboxylate groups of adjacent dianions [$\text{Zn-O} = 2.064(2), 2.317(2) \text{ \AA}$]. The dicarboxylate ligand, which is located about a crystallographic two-fold axis, acts in the bis-chelate mode to bridge the metal atoms into a linear chain running along the *c*-axis of the unit cell. The six-coordinate octahedral geometry is completed by two bipyridine ligands that are *trans*-to each other.

Experimental

The title compound was obtained from a hydrothermal synthesis by reacting zinc nitrate, succinic acid, 4,4'-bipyridine and sodium hydroxide at 180°C for 60 hours.

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