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Key indicators

Single-crystal X-ray study
 $T = 293\text{ K}$
Mean $\sigma(\text{C}-\text{C}) = 0.008\text{ \AA}$
 R factor = 0.061
 wR factor = 0.099
Data-to-parameter ratio = 13.5For details of how these key indicators were
automatically derived from the article, see
<http://journals.iucr.org/e>.

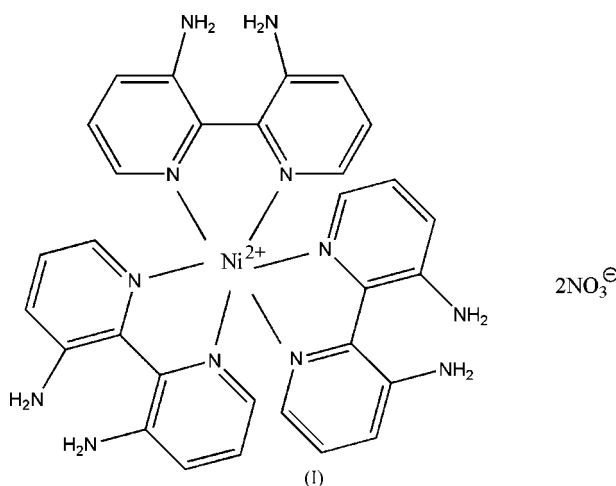
Tris(3,3'-diamino-2,2'-bipyridine)nickel(II) dinitrate

Received 27 June 2006
Accepted 6 July 2006

In the title complex, $[\text{Ni}(\text{C}_{10}\text{H}_{10}\text{N}_4)_3](\text{NO}_3)_2$, the cation has crystallographic $R32$ symmetry while the anion lies on a threefold axis. In the cation, the Ni^{II} atom is coordinated by six N atoms from three 6,6'-diamino-2,2'-bipyridine ligands. In the crystal structure, a two-dimensional network is formed *via* intermolecular $\text{N}-\text{H}\cdots\text{O}$ hydrogen bonds.

Comment

2,2'-Bipyridine and its derivatives are very useful ligands from which a great number of complexes have been synthesized. Some of these complexes have been used in dye-sensitized solar cells (Kuang *et al.*, 2006; Ferrere, 2002). We have an interest in complexes containing bipyridine and its derivatives as ligands, and have synthesized a series of complexes with 6,6'-diamino-2,2'-bipyridine as ligand. We report here the structure of the Ni complex, (I) (Fig. 1).



The Ni^{II} atom, located on the intersection of a threefold and three twofold axes, is coordinated in a distorted octahedral ZnN_6 geometry (Table 1). In the 6,6'-diamino-2,2'-bipyridine ligands, which have twofold rotation symmetry, each pyridine ring is essentially planar with a maximum deviation of 0.068 (4) \AA for atom C5; the dihedral angle between the two pyridine rings is 32.4 (3) $^\circ$. This deviation from planarity is expected in terms of steric relief. The anion lies on a threefold axis. In the crystal structure, intermolecular $\text{N}-\text{H}\cdots\text{O}$ hydrogen bonds (Table 2) connect cations and anions, forming a two-dimensional network.

Experimental

$\text{Ni}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ (0.0316 g, 0.109 mmol) in H_2O (10 ml) was added to 6,6'-diamino-2,2'-bipyridine (0.0101 g, 0.0542 mmol) in acetonitrile

