

## 过渡金属-4,4'-联吡啶配合物的合成及其晶体结构

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**摘要** 由过渡金属与4,4'-联吡啶反应,得到两种新型配合物 $[Zn(4,4'-bpy)\sim 2(H\sim 2O)\sim 2](pic)\sim 2\cdot(4,4'-bpy)\cdot(H\sim 2O)$  (1)与 $[Cu(4,4'-bpy)(pic)\sim 2](2)(4,4'bpy:4,4'$ -联吡啶,  $pic^-$ :苦味酸根),进行了元素分析、红外光谱、X射线衍射等表征。X射线衍射结果表明,晶体1属单斜晶系,空间群为C $\sim$ c,晶胞参数为:a=2.2716(2)nm, b=1.6191(3)nm, c=1.6166(2)nm,  $\beta$ =131.085(7) $^\circ$ , V=4.481(2)nm $^3$ , Z=4;该配合物由4,4'-联吡啶与金属配位形成多孔的二维网,二维网再由未配位的4,4'-联吡啶通过氢键作用沿a方向堆积得三维网状结构,未配位的4,4'-联吡啶、水、苦味酸根离子就被包含在这种网络之中,展示出一定的包含现象,晶体2属三斜晶系,空间群为P1,晶胞参数为:a=0.6100(2)nm, b=1.0186(3)nm, c=1.1046(2)nm,  $\alpha$ =107.230(10) $^\circ$ ,  $\beta$ =101.992(2) $^\circ$ ,  $\gamma$ =97.87(7) $^\circ$ , V=0.6266(3)nm $^3$ , Z=1。在该配合物中,4,4'-联吡啶分子、苦味酸根离子均与铜离子配位,形成一维链状结构。

**关键词** [联吡啶](#) [晶体结构](#) [苦味酸](#) [锌络合物](#) [铜络合物](#) [包合物](#) [元素分析](#) [X射线衍射分析](#)

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## Syntheses and crystal structures of the complexes of transition metal with 4,4'-bipyridine

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**Abstract** Reactions of transition metal picrates with 4,4'-bipyridine gave two complexes  $[Zn(4,4'-bpy)\sim 2(H\sim 2O)\sim 2](pic)\sim 2\cdot(4,4'-bpy)\cdot(H\sim 2O)$  (1) and  $[Cu(4,4'-bpy)(pic)\sim 2](2)$  (4,4'-bpy=4,4'-bipyridine,  $pic^-$ =picric anion), which were characterized by elemental analysis, IR spectroscopy and X-ray diffraction. Complex 1 crystallizes in the monoclinic space group C $\sim$ c with cell parameters a=2.2716(2) nm, b=1.6191(3) nm, c=1.6166(2) nm,  $\beta$ =131.085(7) $^\circ$ , V=4.481(2) nm $^3$ , Z=4. AN infinite 2-D network structure of the complex was constructed by coordination of zinc to 4,4'-bpy. The most interesting feature is that the 2-D network is extended into 3-D network structures by uncoordinated 4,4'-bpy via hydrogen bonds along the a axis. All the uncoordinated 4,4'-bpy, picric anion and water molecules are clathrated in the network, exhibiting a certain inclusion phenomenon. Complex 2 crystallizes in the triclinic space group P1 with cell parameters a=0.6100(2) nm, b=1.0186(3) nm, c=1.1046(2) nm,  $\alpha$ =107.230(10) $^\circ$ ,  $\beta$ =101.992(2) $^\circ$ ,  $\gamma$ =97.87(7) $^\circ$ , V=0.6266(3) nm $^3$ , Z=1. In the complex, the coordination of copper cation to 4,4'-bipyridine and picric anion simultaneously results in the infinite one dimensional 4,4'-bpy-bridged polymeric  $[Cu(4,4'-bpy)(pic)\sim 2]$  chains.

**Key words** [BIPYRIDINE](#) [CRYSTAL STRUCTURE](#) [TRINITROPHENOL P](#) [ZINC COMPLEX](#) [COPPER COMPLEX](#) [CLATHRATES](#) [ELEMENTAL ANALYSIS](#) [X-RAY DIFFRACTION ANALYSIS](#)

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