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# Slow Magnetic Relaxation in Two Octahedral Cobalt(II) Complexes with Positive Axial Anisotropy

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**Abstract:** Two mononuclear Co(II) complexes [Co(L)<sub>4</sub>(NO<sub>3</sub>)<sub>2</sub>] (L= 3-phenylpyrazole for **1** and 4-methylpyridine for **2**) featuring distorted octahedral geometry were prepared and structurally characterized by X-ray crystallographic analyses. Direct-current magnetic and high-frequency/field electron paramagnetic resonance measurements reveal that both complexes have the large and positive *D* values with the non-negligible transverse anisotropy (*E*). Slow magnetic relaxation effects were observed under the applied direct-current field in **1** and **2** by dynamic alternative-current magnetic susceptibility measurements, which provide two interesting examples of six-coordinate Co(II)-based single ion magnets constructed by nitrate groups and nitrogen heterocyclic compounds in mono-dentate coordination modes.

**Keywords:** Cobalt; magnetic properties; single-ion magnet; EPR spectroscopy

## 1. Introduction

The field of single molecule magnets (SMMs) based on single paramagnetic 3*d* ion has invoked much research,<sup>1</sup> and have been rapidly expanding over the past

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