

## Heterometallic Cu/Co and Cu/Co/Zn complexes bearing rare asymmetric tetranuclear cores: synthesis, structures, and magnetic and catalytic properties toward the peroxidative oxidation of cycloalkanes.

### Autorzy

Dmytro S. Nesterov  
Vladimir N. Kokozyay  
Julia Jezierska  
O. V. Pavlyuk  
Roman Boča  
Armando J. L. Pombeiro

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The three novel heterometallic complexes [CuCo(III)Co(II)(2)(MeDea)(3)Cl(3)(CH(3)OH)(0.55)(H(2)O)(0.45)](H(2)O)(0.45) (1), [CuCo(III)Zn(2)(MeDea)(3)Cl(3)(CH(3)OH)(0.74)(H(2)O)(0.26)](H(2)O)(0.26) (2), and [CuCo(III)Zn(2)(MeDea)(3)Cl(3)(DMF)] (3) have been prepared using a one-pot reaction of copper powder with cobalt chloride (1) and zinc nitrate (2, 3) in a methanol (1, 2) or dimethylformamide (3) solution of N-methyldiethanolamine. A search of the Cambridge Structural Database shows that the tetranuclear asymmetric cores M(4)(μ(3)-X)(μ-X)(5) of 1-3 represent an extremely rare case of M(4)X(6) arrays. The magnetic investigations of 1 disclose antiferromagnetic coupling in a Co(II)-Cu(II)-Co(II) exchange fragment with  $J(\text{Co-Cu})/hc = -4.76 \text{ cm}^{-1}$ ,  $J(\text{Co-Co})/hc = -2.76 \text{ cm}^{-1}$ , and  $D(\text{Co})/hc = +34.3 \text{ cm}^{-1}$ . Compounds 1-3 act as precursors for the mild peroxidative oxidation of cyclohexane to cyclohexanol and cyclohexanone with overall yields up to 23%. The synthetic and structural features as well as the thermogravimetric behavior and electrospray ionization mass spectrometry data are discussed.

### Adres publiczny

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### Strona internetowa wydawcy

<https://www.acs.org/content/acs/en.html>

