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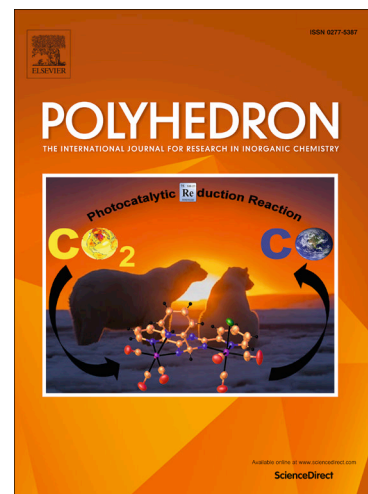
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# Synthesis, crystal structure and DNA/protein binding of tetranuclear Cu(II) complexes with a double-open-cubane like core framework

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## Abstract

The copper(II) complexes  $[\text{Cu}_4(\text{L})_2(\text{HL})_2(\text{H}_2\text{O})_2] \cdot 2(\text{ClO}_4) \cdot 2(\text{H}_2\text{O}) \cdot \text{DMF}$  (**1**) and  $[\text{Cu}_4(\text{L})_2(\text{HL})_2(\text{H}_2\text{O})_2] \cdot (\text{tp})$  (**2**) [ $\text{H}_2\text{L}$  = 2-ethoxy-6-[(1-hydroxymethyl-propylimino)-methyl]-phenol; tp = terephthalate] have been synthesized and characterized by single crystal X-ray diffraction and spectroscopic studies. The structural determination reveals that both the complexes are tetranuclear with a double-open-cubane like core framework. The 2D supramolecular structure of **1** and 3D supramolecular structure of **2** are formed through C-H... $\pi$  and hydrogen bonding interactions, respectively. At room temperature both the complexes exhibit fluorescence with quantum yields of 0.41 and 0.40. The interactions of the complexes with calf thymus DNA (CT-DNA) and serum albumins were investigated using electronic absorption and fluorescence spectroscopic techniques. The studies reveals that the binding affinities of **1** and **2** with CT-DNA are of the order  $8.86 \times 10^5 \text{ M}^{-1}$  and  $7.14 \times 10^5 \text{ M}^{-1}$ , respectively. Additionally, the interaction of the complexes with bovine serum albumin and human serum albumin were studied and the number of binding sites and binding constants were calculated using a double logarithm regression equation. The redox activities of the complexes were investigated in methanol solution by cyclic voltammetry.

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