

# Syntheses, properties, crystal and molecular structure of a novel neutral pentanuclear copper(I) iodide species. Copper(I) complexes with tetraethylthiuram monosulfide

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The reaction of copper(I) iodide with tetraethylthiuram monosulfide LEt afforded the novel copper(I) pentanuclear neutral complex  $[\text{Cu}_5\text{LEt}_2\text{I}_5]\cdot\text{EtOH}\cdot\text{MeCN}$  1. Its crystal structure may be described as a very distorted octahedral central  $\text{Cu}_3\text{I}_3$  cage having two additional  $\text{CuLEt(I)}$  units fused to the central cage by means of two iodine and one sulfur bridging atom. All copper(I) atoms in 1 are tetrahedral and both sulfur ligands are bidentate. The solvent molecules occupy intermolecular vacancies generated by the manner in which 1 is packed in space. In contrast, other copper(I) halides  $\text{CuX}$  ( $\text{X} = \text{Cl}$  or  $\text{Br}$ ) with tetraethylthiuram monosulfide afforded the copper(I) complexes  $[\text{CuLEt(X)}]$  ( $\text{X} = \text{Cl}$  2 or  $\text{Br}$  3) which exist in the solid state as monomeric units featuring three-co-ordinate copper(I). The ligands are bidentate and co-ordination is completed by the halogen atoms. The complexes were additionally characterized by IR and  $^1\text{H}$  NMR spectra as well as magnetic susceptibility measurements. Complexes