# Rhenium(IV)-copper(II) hetreobimetallic complexes: synthesis, crystal structure and magnetic properties.

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### Streszczenie

Two Re(IV)–Cu(II) heterometallic complexes $\{(\mathrm{CuL}_\alpha)[\mathrm{ReCl}_4(\mathrm{ox})]\}_n$ (where $\mathrm{L}_\alpha$ = *N-meso*-5,12-$\mathrm{Me}_2$-7,14-$\mathrm{Et}_2$-[14]-4,11-diene$\mathrm{N}_4$), **1**, and $(\mathrm{CuL}_\beta)[\mathrm{ReCl}_4(\mathrm{ox})]$ ($\mathrm{L}_\beta$ = *N-rac*-5,12-$\mathrm{Me}_2$-7,14-$\mathrm{Et}_2$-[14]-4,11-diene$\mathrm{N}_4$*N-rac*-5,12-$\mathrm{Me}_2$-7,14-$\mathrm{Et}_2$-[14]-4,11-diene$\mathrm{N}_4$), **2**, were synthesized. The $[\mathrm{CuL}^{2+}]$ macrocyclic cation is coordinated from above and below by $[\mathrm{ReCl}_4(\mathrm{ox})]^{2-}$ units through the chloro-ligands and creates a chloro-bridged heterometallic $\mathrm{Re}^{\mathrm{IV}}$–$\mathrm{Cu}^{\mathrm{II}}$ one-dimensional zig-zag chain. Compound **2** can be viewed as a heterobimetallic dinuclear unit, in which the Re(IV)-Cu(II) centers are linked by an oxalato bridge. The magnetic behavior of **1** and **2** has been investigated over the temperature range 1.8–300 K. Compound **1** behaves like a ferrimagnetic {Re(IV)–Cu(II)} bimetallic, one-dimensional chain with intrachain antiferromagnetic coupling. Compound **2** shows a weak antiferromagnetic interaction within the [Re(IV)–Cu(II)] unit along with a strong single-ion anisotropy, $D(\mathrm{Re}) = -63\ \mathrm{cm}^{-1}$.

### Słowa kluczowe

Chain structure, Chloro-bridged Re(IV) complexes, Macrocyclic complexes, Exchange interaction, Zero-field splitting

### Adres publiczny

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