

Molekularne materiały magnetyczne = Molecular magnetic materials.

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Streszczenie

The „molecular” term appears more and more often in the materials chemistry. The Nobel Prize in 2016 was awarded to Jean-Pierre Sauvage, Sir J. Fraser Stoddart and Bernard R. Feringa „for the design and synthesis of molecular machines”. Magnetism in molecular scale, also known as molecular nanomagnetism, has been developing intensively since the second half of the last century. This branch of science involves the magnetic properties of coordination compounds of d- and f-electron metals. The paper presents results of the magnetic studies of molecular magnets of copper(II) and dysprosium(III), which have been pursuing in two doctoral thesis. The compounds form trinuclear and triangular molecules. The spin frustration phenomenon observed in the triangular relationship of copper(II) has been described. Since dysprosium(III) ion is characterized by a large magnetic anisotropy, the triangular, trinuclear coordination compound of dysprosium(III) of the formula $[Dy_3 L_5 HLCI_4] \cdot HL$ (where HL = 2-methoxyethanol) presents the characteristic properties of molecular magnets (SMMs) behavior. Two values of the energy barrier were determined as $U_{eff}/k_B = 84,6$ K and 31,2 K with the corresponding relaxation times $\tau_0 = 1,82 \cdot 10^{-6}$ s and $5,19 \cdot 10^{-5}$ s. The data are probably attributed to different geometry of the coupled dysprosium ions.

Słowa kluczowe

magnetism, crystal structure, molecular magnets, spin frustration

magnetyzm, struktura krystaliczna, magnesy molekularne, frustracja spinowa

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