**Nanocomposites and nanomaterials**

**Phase diagram of quasi-2D BEDT-TTF conductors: effect of lattice type on magnetic properties**

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BEDT-TTF family of quasi-two-dimensional organic conductors exhibits large variety of ordered phases [1]. We use the model of electronic subsystem [2] to describe both the stability of magnetically ordered phases in a number of (BEDT-TTF)2X compounds BEDT-TTF is bis(ethylenedithio)tetrathiafulvalene molecule, X denotes monovalent anion (X = Cu[N(CN)2]Cl, Cu[N(CN)2]Br, Cu[N(CN)2]I, Cu(SCN)2, ICl2, AuBr2, AuI2, Ibr2, I3) and the transition driven by temperature change or the external pressure application as the strong electron correlation effects. Due to the variety of packing types and lattice parameters of the compounds from the studied family, and the abundance of the experimental studies of the phase transitions in (BEDT-TTF)2X we are able to explain qualitative differences of behaviour for α- and κ- configurations with taking into account the realistic electronic density of states form and the correlated hopping of electrons, which induces the electron-hole asymmetry [3, 4]. By applying a variant of the projection method in the Green function equation of motion approach we calculated the single-particle energy spectrum, sublattice magnetization in spin- and charge-ordered phases and the transition temperatures. These results allow us to interpret available experimental data and suggest new mechanisms for the magnetic ordering stabilization in (BEDT-TTF)2X compounds.

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