

## **Spin-1/2 Ising-Heisenberg distorted diamond chain with antiferromagnetic Ising and ferromagnetic Heisenberg interactions**

B. Lisnyi

*Institute for Condensed Matter Physics of the National Academy of Sciences of Ukraine, 1 Svientsitskii Str., 79011 Lviv, Ukraine, E-mail: lisnyj@icmp.lviv.ua*

The spin-1/2 Ising-Heisenberg model on a distorted diamond chain is exactly solved by the transfer-matrix method. In case of antiferromagnetic Ising and ferromagnetic  $XXZ$  Heisenberg interactions an influence of the quantum fluctuation and the parallelogram distortion on the ground state, magnetization, susceptibility and specific heat are investigated in detail. It is demonstrated that the zero-temperature magnetization curve may involve intermediate plateaus just at zero and  $1/3$  of the saturation magnetization. The temperature dependence of the specific heat shows up to four distinct peaks at zero magnetic field and up to five distinct peaks at a weak magnetic field. The physical origin of all observed additional peaks of the specific heat has been clarified on the grounds of dominating thermal excitations. The low-temperature two-peak thermal behavior of the specific heat is comprehensively studied.