

SPIN-1/2 ASYMMETRIC DIAMOND
ISING–HEISENBERG CHAIN

B.M. Lisnii

Institute for Condensed Matter Physics,
Nat. Acad. of Sci. of Ukraine
(1, Svetsits'kyi Str., Lviv 79011, Ukraine;
e-mail: lisnyj@icmp.lviv.ua)

S u m m a r y

The ground state and the thermodynamics of a spin-1/2 asymmetric diamond Ising–Heisenberg chain are considered. For the XYZ anisotropic Heisenberg interaction, the exact calculations of the free energy, entropy, heat capacity, magnetization, and magnetic susceptibility are performed using the method of decoration-iteration transformation. In the case of antiferromagnetic interactions (Ising and XXZ anisotropic Heisenberg ones), the ground state, magnetization process, temperature dependence of the magnetization, magnetic susceptibility, and heat capacity are investigated. The influence of geometric frustration and quantum fluctuations on these characteristics is studied.