ANHARMONICITY EFFECTS IN THE PHONON SPECTRUM OF ANISOTROPIC CRYSTALS

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S u m m a r y

Expressions for the renormalized force constants of anisotropic crystal due to the effects of anharmonicity have been obtained in the self-consistent harmonic approximation. The phonon spectra for metals with a hexagonal close-packed lattice have been calculated for various directions of the wave vector. The effects of anharmonicity and the contributions of non-central forces to the vibration spectrum of titanium have been studied. The frequencies of atomic vibrations and the heights of potential barriers for diffusion activation were found to diminish owing to anharmonicity effects. The anisotropy in the dependences of vibration frequencies on the wave vector has been demonstrated to increase, if the ratio between the lattice periods c/a decreases ($c/a < 1.633$). The frequencies of crystal lattice vibrations were shown to decrease with the temperature growth due to anharmonicity effects.