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Energy dissipation in Ni-containing concentrated solid solutions.<sup>1</sup> GERMAN SAMOLYUK, SAI MU, KE JIN, HONGBIN BEI, G. MALCOLM STOCKS, Oak Ridge National Laboratory — Due to high disorder the diffusion processes are noticeably suppressed concentrated solid solution, so called high entropy alloys. It makes these alloys promising candidate for energy application under extreme conditions. Understanding of the energy dissipation in these alloys during the irradiation or interaction with laser bean is extremely important. In the metals and alloys the main channel of energy dissipation is provided by the electronic subsystem. The first principles approach was used to investigate the electronic structure properties of the alloys. The obtained results were used to calculate the electronic part of thermal resistivity caused by scattering of electrons on atomic disorder, magnetic and phonon excitations The contribution of last two excitations to the temperature dependence of thermal resistivity is discussed. The importance of magnetism in 3d transition metals based alloy was demonstrated. In particular, it was shown that antiferromagnetic ordering of chromium or manganese leads to significant increase of electron scattering in alloy containing these elements. It results in significant reduction of conductivity in chromium or manganese containing alloys. The comparison with the existing experimental data is discussed.

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