Mean free path and shear viscosity in central ^{129}Xe+^{119}Sn collisions below 100 MeV/nucleon

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Thermal and transport properties of hot nuclear matter formed in central ^{129}Xe + ^{119}Sn collisions at the Fermi energy are investigated using the isospin-dependent quantum molecular dynamical (IQMD) model [1]. Temperature (T), average density (ρ), chemical potential (μ), mean momentum (P), shear viscosity (η) and entropy density (s) are obtained from the phase-space information. The mean free path (σ_{nn}) and the in-medium nucleon-nucleon cross-section (λ_{nn}) in the largest compressible stage at different incident energy are deduced and compared with the experimental results from Phys. Rev. C 90,064602 (2014). The result shows that λ_{nn} and σ_{nn} have the same trend and similar values as the experimental results when the beam energy is greater than 40 MeV/nucleon at maximum compressed state. Furthermore, the derived shear viscosity over entropy density (η/s) shows a decreasing behaviour to a saturated value around ¾π as a function of incident energy.

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