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The concept of induced surface and curvature tensions and a unied description of the gas of hard discs and hard spheres

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Mathematically rigorous derivation of a system of equations to describe the hadron resonance gas equation of state within the induced surface tension and with the induced surface and curvature tensions approaches is worked out. Such an equation of state allows one to go beyond the Van der Waals approximation for the interaction potential of hard spheres. The compressibility of a single- and two-component hadron mixtures are found for two- and three-dimensional cases. The obtained results are compared with the Carnahan-Starling, Barrio & Solana and Santos equations for the compressibility of gas of hard spheres and hard discs. Also we determined the values of the model parameters which successfully reproduce the above-mentioned equations on different intervals of packing fractions.

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