Scaled particle theory for one- and two-dimensional hard sphere fluids confined in random porous media

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Scaled particle theory (SPT) is the simple semi-intuitive approach developed 50 years ago for the description of thermodynamical properties of hard sphere fluids [1]. This approach is based on the combination of the exact treatment of point scaled particle in hard sphere fluid with the thermodynamical consideration of finite size scaled particle. Recently SPT approach was extended for the description of a hard sphere fluid confined in random porous media [2]. In result the first very accurate analytical results was obtained for hard sphere fluid in hard-sphere and overlapping hard-sphere matrices.

In this report we present the application of SPT theory for the description of one- and two-dimensional hard sphere fluid in different models of porous media, e.g. Madden-Glandt models [3] of hard-sphere and overlapping hard-sphere matrices, model of the hard-sponge model [4] and model of soft-sponge model [5]. The corresponding expressions for the chemical potentials and equation of state are presented and discussed.

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