

Poster session / 5

Compressibility excess and structurization of binary granular mixture

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We consider the property of compressibility of the binary granular mixture paying attention to their local structurization. The Kirkwood-Buff theory [1] has been used in order to provide theoretical description of the free volume and compressibility of model bi-component system [2]. Relevant characters of compactivity has been expressed in terms of partial properties of species. For theoretical modelling of respective reference data we use either hard sphere model or phenomenological data extracted from the physical measurement [3,4].

We show the existence of the nonmonotonic character of the velocity of compaction (different time-scale kinetics) and polodispersive content of system which pass the compression.

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[2]. Gerasymov O.I., Somov M.M. Statistical description of excess properties of many-particle binary systems. Ukr. J. Phys. 60, 324 (2015);

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[3]. Aliotta F., et al. Excess compressibility in binary liquid mixtures. J. Phys. Chem. 126, 224508 (2007); <https://doi.org/10.1063/1.2745292>

[4]. Pillitteri S., Lumay G., Opsomer E., Vandewalle N. From jamming to fast compaction dynamics in granular binary mixtures. Sci. Rep. 9, 7281 (2019); <https://doi.org/10.1038/s41598-019-43519-6>

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