

## An Analytical Expression for the Nonrandomness in Lattice Fluid Equation of State

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The in the common lattice fluid framework the contribution functions are usually divided into a random and nonrandom part. In this work an analytical expression for the nonrandomness of  $r$ -mer fluids is presented. This approach leads to an explicit expression for the local composition model. The resulting nonrandomness factors are explicit and yield higher degrees of free volume contributions than those obtained by Guggenheim's quasi chemical approach. A new equation of state is derived based on the proposed expression and applied to various pure components and mixtures.