Semi-flexible trimers on the square lattice in the full lattice limit

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Trimers are chains formed by two lattice edges, and therefore three monomers. We consider trimers placed on the square lattice, the edges belonging to the same trimer are either colinear, forming a straight rod with unitary statistical weight, or perpendicular, a statistical weight ω being associated to these angular trimers. The thermodynamic properties of this model are studied in the full lattice limit, where all lattice sites are occupied by monomers belonging to trimers. In particular, we use transfer matrix techniques to estimate the entropy of the system as a function of ω. The entropy $s(\omega)$ is a maximum at $\omega = 1$ and our results are compared to earlier studies in the literature for straight trimers ($\omega = 0$), angular trimers ($\omega \to \infty$) and for mixtures of equiprobable straight and angular trimers ($\omega = 1$).

References

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