Abstract

A linear polymer can be thought of as a flexible long chain of beads that follows a lattice where each bead represents a monomer unit. It can be modelled as a self-avoiding random walk on a lattice. When the linear polymer is in a chemical solution and is following a 2-dimensional hexagonal lattice, it becomes self-entangled. It can be shown that in all sufficiently long polymers a pattern is present. Kesten's Pattern Theorem, which was originally proved for self-avoiding walks on cubic lattices, is extended to the self-avoiding walks on hexagonal lattices. Properties of the hexagonal lattice, self-avoiding walks on the hexagonal lattice and the connective constant for the hexagonal lattice are then provided. Further, computation of the probability of a self-avoiding walk on the hexagonal lattice encircling the points $(\frac{1}{2}, \frac{1}{2})$ and $(\frac{1}{2}, -\frac{1}{2})$ is discussed.