Kirchhoff Index of Cyclopolyacenes

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The resistance distance between two vertices of a connected graph G is computed as the effective resistance between them in the corresponding network constructed from G by replacing each edge with a unit resistor. The Kirchhoff index of G is the sum of resistance distances between all pairs of vertices. In this paper, following the method of Y. J. Yang and H. P. Zhang in the proof of the Kirchhoff index of the linear hexagonal chain, we obtain the Kirchhoff index of cyclopolyacenes, denoted by HR_n, in terms of its Laplacian spectrum. We show that the Kirchhoff index of HR_n is approximately one third of its Wiener index.

Key words: Resistance Distance; Kirchhoff Index; Laplacian Spectrum; Cyclopolyacenes.