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On the PI polynomial of a graph[Ashrafi, A.R.](#)^a   [Manoochehrian, B.](#)^b  [Yousefi-Azari, H.](#)^c  ^a Department of Mathematics, Faculty of Science, University of Kashan, Kashan, Iran^b Academy for Education, Culture and Research, Tehran, Iran^c School of Mathematics, Statistics and Computer Science, University of Tehran, Tehran, Iran**Abstract**

The Padmakar-Ivan (PI) index of a graph G is defined as $PI(G) = [n_{eu}(e|G) + n_{ev}(e|G)]$, where $n_{eu}(e|G)$ is the number of edges of G lying closer to u than to v , $n_{ev}(e|G)$ is the number of edges of G lying closer to v than to u and summation goes over all edges of G . In this paper, we define the PI polynomial of a graph and investigate some of the elementary properties of this polynomial and compute it for some well-known graphs. Finally, we generalize some of the properties of Wiener polynomial to PI polynomial.

Author Keywords

Chemical graph; PI index; PI polynomial

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Chemicals and CAS Registry Numbers: calcium phosphate; berilium
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