ON ORDERING OF TREES BY MULTIPLICATIVE VERSION OF ZAGREB INDICES

Mehdi Eliasi[1]

Department of Mathematics and Computer Science, Faculty of Khansar, University of Isfahan, P.O.Box 87931133111, Khansar, Iran

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Abstract

A topological index is a real number related to a molecular graph, which is a graph invariant and which has some chemical application. Let $G = (V, E)$ be a molecular graph representing of a chemical structures. The first and the second Zagreb indices of G are defined as:

$$M_1(G) = \sum_{uv \in E(G)} [d_G(u) + d_G(v)], \quad M_2(G) = \sum_{uv \in E(G)} [d_G(u) d_G(v)],$$

respectively, where d_u denotes the degree of vertex u. These indices have been used to study molecular complexity, chirality, ZE-isomerism and hetero-systems. Gutman et al. [1, 2] have recently proposed to consider the multiplicative variants of Zagreb indices as:

$$P_1^*(G) = \prod_{uv \in E(G)} [d_G(u) + d_G(v)], \quad P_2(G) = \prod_{uv \in E(G)} [d_G(u) d_G(v)],$$

In this paper for chemical trees, we introduce some graph transformations, which decrease Π_1^* and Π_2 . By using these operations, we identify classes of trees, which have smallest multiplicative version of Zagreb indices among all chemical trees of order $n \geq 16$.

Keywords: Zagreb indices, Graph operation, Chemical tree

References

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[1] eliasi@math.iut.ac.ir