

Research Article

A View of Banhatti and Revan Indices in Chemical Graphs

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A special type of graph invariant called topological index is the collection of data on algebraic graphs and provides a mathematical way to understand chemical structural features. One of the driving factors behind the wide public attention according to these indices is their remarkable ability to correlate and predict the properties of a wide range of molecular species. Our concern is basically with the study of molecular structures, its shapes, geometries, number of atoms, vertices, bond length, and bond strength. It is very expensive to find the properties of compounds in laboratories due to different expensive apparatus and expensive rare material. It is also time consuming and requires an expert person to perform the experiments. So with the help of graphs and topological index, we want to give an easy approach to find the different characteristics of molecular structures with practical lab experiments. It is a mathematical and theoretical method to estimate the physicochemical properties. Many physicochemical features of a molecular compound can be predicted using topological indices. In this article, we will determine some topological invariants of silicon carbide $\text{SiC}_3\text{-I}[t, u]$ for all values of t and u .

1. Introduction

Chemical graph theory is a field of mathematical chemistry that has a significant impact on the advancement of the chemical sciences. Physicochemical aspects of chemical compounds are frequently characterized in chemical science using molecular-based structural descriptors, also known as graph indices or topological indices; see [1, 2] for graph indices. A chemical graph is a graph in which chemical bonds are portrayed as edges and atoms of a molecule and are portrayed as vertices.

Chemical theory is a branch of graph theory concerned with the discovery of topological indices of chemical graphs that are closely correlated with the chemical properties of chemical compounds. A topological index is a statistical indicator constructed empirically from the network structure. Topological indices have been proven to be effective for assessing correlations between the structure of a molecular compound and its physical characteristics or bioactivities [3–10]. Topological indices are a practical way to convert

chemical composition into numerical values that can be utilized in QSPR and QSAR (quantitative-structure property relationship and quantitative-structure activity relationship, respectively) studies to correlate with physical attributes.

In recent years, the application of graph invariant in QSPR and QSAR investigations has piqued desire. The study of topological indices is extremely important in nanotechnology and theoretical chemistry. Topological indices have been used in chemistry, physics, mathematics, informatics, biology, and other fields [11, 12]. Many topological descriptors were introduced in the latter decades of the 20th century to meet the needs of chemists [13, 14].

The structure utilized in this manuscript is a special isomer of silicon carbide. Silicon carbide has a tetrahedral structure. It is an important gradient for host-guest reaction. It is used in bullet proof jackets, car breaks, LED lights, jewelry, and detectors. Revan and Banhatti indices have a very good correlation with many properties of $\text{SiC}_3\text{-I}[t, u]$.

Kulli is an Indian mathematician who proposed the Banhatti indices by inspiring the Zagreb indices given by