

## Wiener Index Of A Graph And Chemical Applications

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The Wiener index, denoted  $W$  (Wiener 1947) and also known as the "path number" or Wiener number (Plavšić et al. 1993), is a graph index defined for a graph on nodes by  $W = \sum_{u,v \in V} d(u,v)$  where  $d(u,v)$  is the graph distance matrix. Unless otherwise stated, hydrogen atoms are usually ignored in the computation of such indices as organic chemists usually do when they write a benzene ring as a hexagon (Devillers and Balaban 1999, p. 25).

### Wiener Index -- from Wolfram MathWorld

In chemical graph theory, the Wiener index (also Wiener number) introduced by Harry Wiener, is a topological index of a molecule, defined as the sum of the lengths of the shortest paths between all pairs of vertices in the chemical graph representing the non-hydrogen atoms in the molecule.

### Wiener index - Wikipedia

The Wiener index  $W(G)$  of a connected graph  $G$ , introduced by Wiener in 1947, is defined as  $W(G) = \sum_{u,v \in V(G)} d(u,v)$  where  $d(u,v)$  is the distance between vertices  $u$  and  $v$  of  $G$ . The Steiner distance in a...

### (PDF) The Steiner Wiener Index of A Graph

The Wiener index of a graph  $G$ , denoted by  $W(G)$  is the sum of the distances between all (unordered) pairs of vertices of  $G$ . In this paper, we obtain the Wiener index of line graphs and some class of...

### (PDF) On the Wiener index of a graph - ResearchGate

Abstract. A modification of the Wiener index which properly takes into account the symmetry of a graph is proposed. The explicit formulae for the modified Wiener index of path, cycle, complete bipartite, cube and lattice graphs are derived and compared with their standard Wiener index. This is a preview of subscription content, log in to check access.

### On the Wiener index of a graph | SpringerLink

The Wiener index of a graph  $G=(V,E)$ , denoted by  $W(G)$ , was introduced in 1947 by chemist Harold Wiener as the sum of distances between all vertices of  $G$ :  $W(G)=\sum_{\{u,v\} \subseteq V(G)} d(u,v)$ . The first and the second Zagreb indices were introduced more than thirty years ago by Gutman and Trinajestic.

### Wiener index of some graph operations - ScienceDirect

The Wiener index of the graph  $G$ , denoted by  $W = W(G)$ , is the sum of distances between all pairs of vertices of  $G$ . The Wiener index of graphs has been studied in much detail (see the reviews, , , the recent papers, , , , , , , , and the references cited therein). Yet, Wiener indices of Eulerian graphs seem to have evaded the attention of scholars.

### Wiener index of Eulerian graphs - ScienceDirect

The Wiener index of a connected graph is the sum of the distance of all pairs of distinct vertices. It was introduced by Wiener in 1947 to analyze some aspects of branching by fitting experimental data for several properties of alkane compounds. Denote by  $\mathcal{U}_n$ ,  $\mathcal{E}_r$  the set of unicyclic graphs with  $n$  vertices and  $r$  vertices of even degree.

### Wiener index of unicycle graphs with given number of even ...

The Wiener index is a topological index of a molecular graph, defined as the sum of distances between all pairs of its vertices. Benzenoid graphs include molecular graphs of polycyclic aromatic hydrocarbons. An edge thorny graph  $G$  is constructed from a catacondensed benzenoid graph  $H$  by attaching

new graphs to edges of a perfect matching of  $H$ .

### Wiener Index of Edge Thorny Graphs of Catacondensed Benzenoids

The Wiener index of a connected graph  $G$  is the sum of distances between all pairs of vertices of  $G$ . We characterize Eulerian graphs (with a fixed number of vertices) with smallest and greatest Wiener indices.

### Wiener index of Eulerian graphs | Discrete Applied Mathematics

$n$  is equal to its Wiener index, which is a sum of distances between all pairs of vertices.

### ON THE WIENER INDEX AND LAPLACIAN COEFFICIENTS OF GRAPHS ...

The Wiener index is a well-known distance-based topological index introduced as structural descriptor for acyclic organic molecules [17]. It is defined as the sum of distances between all unordered pairs of vertices of a simple graph  $G$ , i.e.,  $W(G) = \sum_{\{u,v\} \subseteq V(G)} d(u,v) = \frac{1}{2} \sum_{v \in V(G)} d_G(v)$ .

### Wiener Index of Graphs and Their Line Graphs | SpringerLink

The Wiener index (or Wiener number) [18] of a graph  $G$ , denoted by  $W(G)$  is the sum of the distances between all (unordered) pairs of vertices of  $G$ , that is 2000 Mathematics Subject Classification ...

### ON THE WIENER INDEX OF A GRAPH - researchgate.net

Wiener index. The Wiener index of a vertex is the sum of the shortest path distances between  $v$  and all other vertices. The Wiener index of a graph  $G$  is the sum of the shortest path distances over all pairs of vertices. Used by mathematical chemists (vertices = atoms, edges = bonds). Random walk.

### 4.1 Undirected Graphs - Princeton University

The Wiener index of a graph, denoted by  $W$ , is one of the oldest topological indexes, which was first introduced by Wiener in 1947. It is defined as where the summation goes over all pairs of vertices of  $G$ . The hyper-Wiener index of acyclic graphs was introduced by Randić in 1993.

### The Hyper-Wiener Index of Trees of Order with Diameter

Abstract In this short paper, we show that, with three exceptions, if the Wiener index of a connected graph of order  $n$  is at most  $(n + 5)(n - 2) / 2$ , then it is traceable. Share content Export citation Request permission

### WIENER INDEX AND TRACEABLE GRAPHS | Bulletin of the ...

The Wiener index of a graph  $G$  is equal to the sum of distances between all pairs of vertices of  $G$ . It is known that the Wiener index of a molecular graph correlates with certain physical and chemical properties of a molecule.

### How to compute the Wiener index of a graph

The Hosoya index is the first topological index recognized in chemical graph theory, and it is often referred to as "the" topological index. Other examples include the Wiener index, Randić's molecular connectivity index, Balaban's  $J$  index, and the TAU descriptors.

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