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Mathematical aspects of Wiener index

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Abstract: The Wiener index (i.e., the total distance or the transmission number), defined as the sum of distances between all unordered pairs of vertices in a graph, is one of the most popular molecular descriptors. In this article we summarize some results, conjectures and problems on this molecular descriptor, with emphasis on works we were involved in.

Keywords: Graph distance, Wiener index, average distance, topological index, molecular descriptor, chemical graph theory.

Math. Subj. Class.: 05C12, 05C05, 05C20, 92E10



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Matematični vidiki Wienerjevega indeksa

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Povzetek: Wienerjev indeks (t.j. celotna razdalja oziroma transmisijsko število), definiran kot vsota razdalj med vsemi pari vozlišč v grafu, je eden od najbolj priljubljenih molekularnih parametrov. V tem članku povzemamo nekaj rezultatov, hipotez in problemov o tem molekularnem parametru, s poudarkom na naših raziskavah v zvezi z njim.

Ključne besede: Razdalja v grafih, Wienerjev indeks, povprečna razdalja, topološki indeks, molekularni parameter, kemijska teorija grafov.

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