

On Randić energy of a graph

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Let $G = (V, E)$ be a simple graph of order n with vertex set $V = V(G) = \{v_1, v_2, \dots, v_n\}$ and edge set $E = E(G)$. Let d_i be the degree of the vertex $v_i \in V(G)$, $i = 1, 2, \dots, n$. The Randić matrix $\mathbf{R} = \mathbf{R}(G) = ||R_{ij}||_{n \times n}$ is defined by

$$R_{ij} = \begin{cases} \frac{1}{\sqrt{d_i d_j}}, & \text{if the vertices } v_i \text{ and } v_j \text{ are adjacent,} \\ 0, & \text{otherwise.} \end{cases}$$

The eigenvalues of matrix \mathbf{R} , denoted by $\rho_1, \rho_2, \dots, \rho_n$, are called the Randić eigenvalues of graph G . The Randić energy of graph G , denoted by RE , is a graph invariant defined by

$$RE = RE(G) = \sum_{i=1}^n |\rho_i|.$$

Some upper and lower bounds on Randić energy are presented.