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خلاصه مقاله:

The energy of a graph G, denoted by $\mathcal{E}(G)$, is defined as the sum of absolute values of all eigenvalues of G. A graph G is called reciprocal if $\frac{1}{\lambda}$ is an eigenvalue of G whenever λ is an eigenvalue of G. Further, if λ and $\frac{1}{\lambda}$ have the same multiplicities, for each eigenvalue λ, then it is called strong reciprocal. In (MATCH Commun. Math. Comput. Chem. ۸۳ (۲۰۲۰) ۶۳۱--۶۳۳), it was conjectured that for every graph G with maximum degree $\Delta(G)$ and minimum degree $\delta(G)$ whose adjacency matrix is non-singular, $\mathcal{E}(G) \geq \Delta(G) + \delta(G)$ and the equality holds if and only if G is a complete graph. Here, we prove the validity of this conjecture for some strong reciprocal graphs. Moreover, we show that if G is a strong reciprocal graph, then $\mathcal{E}(G) \geq \Delta(G) + \delta(G) - \frac{1}{2}$. Recently, it has been proved that if G is a reciprocal graph of order n and its spectral radius, ρ, is at least $4\lambda_{min}$, where λ_{min} is the smallest absolute value of eigenvalues of G, then $\mathcal{E}(G) \geq n+\frac{1}{2}$. In this paper, we extend this result to almost all strong reciprocal graphs without the mentioned assumption.

کلمات کلیدی:

Graph energy, Strong reciprocal graph, Non-singular graph