On diameter and inverse degree of a graph

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The inverse degree $r(G)$ of a finite graph $G = (V, E)$ is defined as $r(G) = \sum_{v \in V} \frac{1}{\deg\ v}$, where deg v is the degree of vertex v. We establish inequalities concerning the sum of the diameter and the inverse degree of a graph which for the most part are tight. We also find upper bounds on the diameter of a graph in terms of its inverse degree for several important classes of graphs.