On the Forcing, Total Forcing, Anti-Forcing and Anti-Kekulé Numbers

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Let G be any graph and κ Kekulé structure on G. The smallest number of edges that completely determines κ is forcing number of G. Global forcing number is the smallest number of edges that completely determines all Kekulé structures of the observed graph. Anti-Kekulé number is the smallest number of edges that need to be deleted from graph in order that remaining graph is connected, but without Kekulé structures. Anti-forcing number is the smallest number of edges that need to be deleted from the observed graph in order that G has a unique Kekulé structure.

These four concepts of forcing number, total forcing number, anti-forcing number and anti-Kekulé number will be explained in detail. The calculation of these invariants will be demonstrated on several graphs. The emphasis is given on fullerene-graphs.