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Nice subgraphs of fullerene graphs with prescribed components

Let G be a graph with a perfect matching. A subgraph H of G is nice if $G - V(H)$ still has a perfect matching. In a chemical context, nice subgraphs of molecular graphs serve as mathematical models of addition patterns in the corresponding molecules such that the rest of the molecule still has a resonant structure. In this contribution we consider classical and generalized fullerene graphs and look for nice subgraphs with prescribed components such as, e.g., stars and odd cycles. We also report some computational results for small fullerenes and list some open problems.