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Abstract

The algebraic structure count of a graph G can be defined by $ASC\{G\} = \sqrt{\mid detA \mid}$ where A is the adjacency matrix of G. In chemistry, thermodynamic stability of a hydrocarbon is related to the ASC-value for the graph which represents its skeleton. In the case of benzenoid graphs (connected, bipartite, plane graphs which have the property that every face-boundary (cell) is a circuit of length of the form $4s + 2$ $(s = 1, 2, \ldots)$), the ASC-value coincides with $K\{G\}$ - the number of perfect matchings (Kekulé structures). However, in the case of non-benzenoid graphs (in which some cells are circuits of length of the form $4s (s = 1, 2, \ldots)$) these two numbers $ASC\{G\}$ and $K\{G\}$ can be different. Angular hexagonal-square chains (open and closed) belong to this latter class. In this paper we show that the algebraic structure count for these graphs can be expressed by means of Fibonacci and Lucas numbers.