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Counting maximal matchings in linear polymers

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Abstract: A matching M in a graph G is maximal if it cannot be extended to a larger matching in G . In this paper we show how several chemical and technical problems can be successfully modeled in terms of maximal matchings. We introduce the maximal matching polynomial and study its basic properties. Then we enumerate maximal matchings in several classes of graphs made by a linear or cyclic concatenation of basic building blocs. We also count maximal matchings in joins and corona products of some classes of graphs.

Keywords: Maximal matching, maximal matching polynomial, cactus graph, cactus chain, Padovan numbers, Perrin numbers, corona product.

Math. Subj. Class.: 05C30, 05C70



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Štetje maksimalnih prirejanj v linearnih polimerih

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Povzetek: Prirejanje M v grafu G je maksimalno, če ga ni mogoče razširiti do večjega prirejanja v G . V tem članku pokažemo, kako lahko številne kemijske in tehniške probleme uspešno modeliramo z maksimalnimi prirejanji. Vpeljemo polinom maksimalnega prirejanja in raziščemo njegove osnovne lastnosti. Nato preštejemo maksimalna prirejanja v različnih razredih grafov, dobljenih z linearnim ali cikličnim spajanjem osnovnih gradnikov. Preštejemo tudi maksimalna prirejanja v spojih in kronskih produktih nekaterih razredov grafov.

Ključne besede: Maksimalno prirejanje, polinom maksimalnega prirejanja, kaktusni graf, kaktusna veriga, Padovanova števila, Perrinova števila, kronski produkt.

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