Benzenoid: Having the six-membered ring structure or aromatic properties of benzene.

Pyrene  Benzo[c]phenanthrene  Triphenylene
Phenanthrene  Benz[a]anthracene  Chrysene
Naphthalene  Anthracene  Tetracene

http://www.astrochem.org/sci/Cosmic_Complexity_PAHs.php
**Matching**: collection of disjoint edges.

**Benzenoid hexagon**: hexagon with 3 matching edges.

**Fries number**: maximum over all perfect matchings of the number of benzenoid hexagons.
Fries 22
Clar number: maximum over all perfect matchings of the number of independent benzenoid hexagons.
STM current-image of hexabenzocoronene

from
I Gutman, Ž Tomović, K Müllen, J P Rabe,
Counterexamples to a proposed algorithm for finding the Fries number of a benzenoid

Wendy Myrvold, Patrick W. Fowler

and William H. Bird

How many perfect matchings does this graph have?

What are the perfect matchings?
Randic current model: Consider ordered pairs of perfect matchings.
Conjugated Circuits:

- Occurs 2 times. 
  \((BC, CB)\).

- Occurs 2 times. 
  \((AB, BA)\).

- Occurs 2 times. 
  \((AC, CA)\).
Current flow: counterclockwise in $4n+2$ cycles and clockwise in $4n$ cycles.

Sum the currents for each pair of matchings to get current estimate.