HAMILTONIAN GRAPHS AND THE ENUMERATION OF SPANNING TREES

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The simple theory of π-electron "ring currents" in conjugated systems will be examined with particular reference to the graph theoretical aspects of it.[1] It will be emphasised that several graph-theoretical ideas — notably those concerning circuits and spanning trees — specifically underlie the ring current concept; it will also be pointed out that a unitary transformation originally proposed by McWeeny[2] applies to semi- (or 'path'-) Hamiltonian molecular graphs, whereas one recently devised by Gayoso and Boucekkine[3] can be applied to any simple connected graph.

This will lead to a discussion of the search for conditions for any arbitrary graph to be Hamiltonian[4] and of the enumeration of spanning trees[5-7]. In particular, examples will be given of Waller's recent elegant extension[6], concerning 'row-regularised' graphs, of Kirchhoff's 'matrix-tree' theorem[7].

References

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