On Statistics of Graph Energy

Ante Graovac[a,b], Ivan Gutman[c], Peter E. John[d], Dušica Vidović[c], and Ivana Vlah[a]

[a] Faculty of Science, University of Split, Nikole Tesle 12, HR-21000 Split, Croatia
[b] The R. Bošković Institute, P.O. Box 180, HR-10002 Zagreb, Croatia
[c] Faculty of Science, University of Kragujevac, P.O. Box 60, YU-34000 Kragujevac, Yugoslavia, and
[d] Institut für Mathematik, Technische Universität Ilmenau, PF 100565, D-98684 Ilmenau, Germany

Reprint requests to Prof. I. G.; Fax: +381 34 335040; E-mail: gutman@knez.uis.kg.ac.yu

Z. Naturforsch. **56a,** 307–311 (2001); received January 26, 2001

The energy E_G of a graph G is the sum of the absolute values of the eigenvalues of G. In the case whene G is a molecular graph, E_G is closely related to the total π-electron energy of the corresponding conjugated molecule. We determine the average value of the difference between the energy of two graphs, randomly chosen from the set of all graphs with n vertices and m edges. This result provides a criterion for deciding when two (molecular) graphs are almost coenergetic.

Key words: Energy (of graph); Total π-electron Energy; Coenergetic Graphs.