On the Randić's Matrix: old and new

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Inspired by Randić's idea, Wang et al. redefined and renamed the $D_{\rm MAX}$-matrix of a graph as the *eccentricity matrix*, which is constructed from the distance matrix so that in each row and each column it only retains the eccentricities, while other elements of the distance matrix are set to be zero. In this report, we first review some applications of this matrix in the chemical graph theory, and then partially answer an open problem by its algebraic properties.

References

[1] M. Capobianco, Self-centered graphs, Proc. 2nd Int. Conf. in Combinatorics, Annals of the New York Academy of Sciences, 1979.

[2] M. Randić, $D_{\rm MAX}$-Matrix of dominant distances in a graph, MATCH Commun. Math. Comput. Chem. **70** (2013), 221–238.

[3] M. Randić, R. Orel and A. T. Balaban, $D_{\rm MAX}$-matrix invariants as graph descriptors. graphs having the same Balaban index J, MATCH Commun. Math. Comput. Chem. **70** (2013), 239–258.

[4] J. F. Wang, M. Lu, F. Belardo and M. Randić, The anti-adjacency matrix of a graph: eccentricity matrix, submitted.

[5] J. F. Wang, M. Lu, S.M. Cioabă and Q.X. Huang, Self-centered graph and eccentricity matrix, submitted.