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Computation of Adriatic (*a*, *b*)-*KA* Index of some Nanostructues

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Abstract: *Adriatic indices are analyzed on the testing sets provided by the International Academy of Mathematical Chemistry (IAMC), these indices were selected as significant predictors of physicochemical properties. In this study, we introduce the certain discrete Adriatic (a, b)-KA index of molecular graph and compute exact formulas for certain important families of dendrimers along with their comparative analysis.*

Keywords: *Topological index, Adriatic (a, b)-KA index, dendrimer.*

Mathematics Subject Classification: 05*C*05, 05*C*12, 05*C*35.

I. Introduction

In Chemical Graph Theory, concerning the definition of the topological index on the molecular graph and concerning chemical properties of drugs can be studied by the topological index calculation see [1]. Numerous degree based topological indices have been appeared in the literature [2] and have found some applications in QSPR/GSAR research [3, 4, 5]. Some of the most useful topological descriptors are bond additive. Adriatic indices were introduced by Vukičević et al. [6] as a way of generalizing well known bond additive indices. Recently some discrete Adriatic indices were studied, for example in [7].

Let G be a simple, finite, connected graph with *the* vertex set $V(G)$ and edge set $E(G)$. The degree $d_G(u)$ of a vertex u is the number of vertices adjacent to u. The additional definitions and notations, the reader may refer to [8].

The misbalance deg index (or irregularity index [9]) of G is defined as

$$\alpha_1(G) = \sum_{uv\in E(G)} \left| d_G(u) - d_G(v) \right|.$$

Minus F-index or nonzero Zagreb index was introduced and studied by Kulli in [10] and Jahabani et al. in [11], defined it as

$$MF(G) = \sum_{uv\in E(G)} \left| d_G(u)^2 - d_G(v)^2 \right|.$$

In [12], Gutman et al. introduced σ-index of a graph G, which is defined as σ(G)

$$\sigma(G) = \sum_{uv\in E(G)} \left[d_G(u) - d_G(v) \right]^2$$

In [6], Vukicevic et al. introduced the following bond additive discrete Adriatic indices:
The misbalance indeg index of G defined as

$$\alpha_{-1}(G) = \sum_{uv\in E(G)} \left| \frac{1}{d_G(u)} - \frac{1}{d_G(v)} \right|.$$

The misbalance irdeg index of G is defined as

$$\alpha_{-\frac{1}{2}}(G) = \sum_{uv\in E(G)} \left| \frac{1}{\sqrt{d_G(u)}} - \frac{1}{\sqrt{d_G(v)}} \right|.$$

The misbalance rodeg index of G is defined as

$$\alpha_{\frac{1}{2}}(G) = \sum_{uv\in E(G)} \left| \sqrt{d_G(u)} - \sqrt{d_G(v)} \right|.$$

The general minus index [13] of a graph *G* is defined as

$$M_i^a(G) = \sum_{uv \in E(G)} \left[\left| d_G(u) - d_G(v) \right| \right]^a$$

where *a* is a real number.

The misbalance sdeg index [14] of a graph *G* is defined as

$$\alpha_{-2}(G) = \sum_{uv \in E(G)} \left| \frac{1}{d_G(u)^2} - \frac{1}{d_G(v)^2} \right|$$

The general misbalance deg index [15] of a graph *G* is defined as

$$\alpha_a(G) = \sum_{uv \in E(G)} \left| d_G(u)^a - d_G(v)^a \right|$$

where *a* = { - ½, ½, -1, 1 }. Furthermore, Kulli in [14] extended this definition for a real number *a*.

In [16], the Randic index itself is directly related to an irregularity measure, which is defined as

$$IRA(G) = \sum_{uv \in E(G)} \left(\frac{1}{\sqrt{d_G(u)}} - \frac{1}{\sqrt{d_G(v)}} \right)^2.$$

In [16]], the IRB index of a graph *G* was $\sum_{uv}$ defined as

$$IRB(G) = \sum_{uv \in E(G)} \left(\sqrt{d_G(u)} - \sqrt{d_G(v)} \right)^2.$$

We introduce the Adriatic (a, b)-KA index and coindex of a graph *G* and they are defined as

$$MKA_{a,b}^1(G) = \sum_{uv \in E(G)} \left[\left| d_G(u)^a - d_G(v)^a \right| \right]^b$$

$$\overline{MKA}_{a,b}^1(G) = \sum_{uv \notin E(G)} \left[\left| d_G(u)^a - d_G(v)^a \right| \right]^b$$

where *a* and *b* are real numbers.

We easily see that

(1) $\alpha_1(G) = MKA_{1,1}^1(G)$. (2) $MF(G) = MKA_{2,1}^1(G)$.

(3) $\sigma(G) = MKA_{1,2}^1(G)$. (4) $\alpha_{-1}(G) = MKA_{-1,1}^1(G)$.

(5) $\alpha_{-\frac{1}{2}}(G) = MKA_{-\frac{1}{2},1}^1(G)$. (6) $\alpha_{\frac{1}{2}}(G) = MKA_{\frac{1}{2},1}^2(G)$.

(7) $M_i^a(G) = MKA_{1,a}^1(G)$. (8) $\alpha_{-2}(G) = MKA_{-2,1}^1(G)$.

(9) $\alpha_a(G) = MKA_{a,1}^1(G)$. (10) $IRA(G) = MKA_{-\frac{1}{2},2}^1(G)$.

(11) $IRB(G) = MKA_{\frac{1}{2},2}^1(G)$.

Clearly, we obtain some other graph indices directly as a special case of minus (*a*, *b*)-*KA* indices for some special values of *a* and *b*.

In this paper, we compute the minus (*a, b*)-*KA* indices of polycyclic aromatic hydrocarbons and benzenoid systems.

II. Results for Porphyrin Dendrimer D_nP_n

We consider the family of porphyrin dendrimers. This family of dendrimers is denoted by D_nP_n. The molecular graph of D_nP_n is shown in Figure 1.

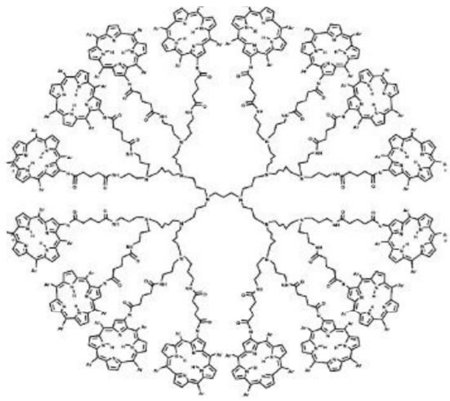

Figure 1. The molecular graph of D_nP_n

Let G be the molecular graph of D_nP_n. By calculation, we find that G has $96n – 10$ vertices and $105n – 11$ edges. In D_nP_n, there are six types of edges based on degrees of end vertices of each edge as given in Table 1.

$d_G(u), d_G(v) \setminus uv \in E(G)$	(1, 3)	(1, 4)	(2, 2)	(2, 3)	(3, 3)	(3, 4)
Number of edges	$2n$	$24n$	$10n – 5$	$48n – 6$	$13n$	$8n$

Table 1. Edge partition of D_nP_n

In the following theorem, we compute the minus (a, b)-KA index of D_nP_n.

Theorem 1. Let D_nP_n be the family of porphyrin dendrimers. Then

$$MKA^1_{a,b}(D_nP_n) = \left(\left|1^a - 3^a\right|\right)^b 2n + \left(\left|1^a - 4^a\right|\right)^b 24n + \left(\left|2^a - 3^a\right|\right)^b (48n-6) + \left(\left|3^a - 4^a\right|\right)^b 8n..$$

Proof: From definition and by using Table 1, we deduce

$$MKA^1_{a,b}(D_nP_n) = \sum_{uv \in E(G)} \left[\left|d_G(u)^a - d_G(v)^a\right|\right]^b$$

$$= \left(\left|1^a - 3^a\right|\right)^b 2n + \left(\left|1^a - 4^a\right|\right)^b 24n + \left(\left|2^a - 2^a\right|\right)^b (10n-5) + \left(\left|2^a - 3^a\right|\right)^b (48n-6)$$

$$+ \left(\left|3^a - 3^a\right|\right)^b 13n + \left(\left|3^a - 4^a\right|\right)^b 8n$$

$$= \left(\left|1^a - 3^a\right|\right)^b 2n + \left(\left|1^a - 4^a\right|\right)^b 24n + \left(\left|2^a - 3^a\right|\right)^b (48n-6) + \left(\left|3^a - 4^a\right|\right)^b 8n.$$

From Theorem 1, we establish the following results.

Corollary 1.1. Let D_nP_n be the family of porphyrin dendrimers. Then

(1) $\alpha_1(D_nP_n) = MKA^1_{1,1}(D_nP_n) = 132n - 6.$

(2) $MF(D_nP_n) = MKA^1_{2,1}(D_nP_n) = 672n - 30.$

(3) $\sigma(D_nP_n) = MKA^1_{1,2}(D_nP_n) = 280n - 6.$

(4) $\alpha_{-1}(D_nP_n) = MKA^1_{-1,1}(D_nP_n) = 28n - 1.$

(5) $\alpha_{-\frac{1}{2}}(D_nP_n) = MKA^1_{-\frac{1}{2},1}(D_nP_n) = \left(10 - \frac{42}{\sqrt{3}} + \frac{48}{\sqrt{2}}\right)n - \left(\frac{1}{\sqrt{2}} - \frac{1}{\sqrt{3}}\right).$

(6) $\alpha_{\frac{1}{2}}(D_nP_n) = MKA^2_{\frac{1}{2},1}(D_nP_n) = \left(38 + 42\sqrt{3} - 48\sqrt{2}\right)n - \left(\sqrt{3} - \sqrt{2}\right)6.$

(7) $M_i^a(D_nP_n) = MKA^1_{1,a}(D_nP_n) = (|1-3|)^a 2n + (|1-4|)^a 24n$

$$+(|2-3|)^a (48n-6) + (|3-4|)^a 8n$$

(8) $\alpha_{-2}(D_nP_n) = MKA^1_{-2,1}(D_nP_n) = \frac{94n}{3} - \frac{5}{6}.$

(9) $\alpha_a(D_nP_n) = MKA^1_{a,1}(D_nP_n) = (|1-3^a|)2n + (|1-4^a|)24n$

$$+(|2^a-3^a|)(48n-6) + (|3^a-4^a|)8n.$$

(10) $IRA(D_nP_n) = MKA^1_{-\frac{1}{2},2}(D_nP_n) = \left[\left(1-\frac{1}{\sqrt{3}}\right)^2 2 + 6 + \left(\frac{1}{\sqrt{2}}-\frac{1}{\sqrt{3}}\right)^2 48 + \left(\frac{1}{\sqrt{3}}-\frac{1}{2}\right)^2 8\right]n$

$$-\left(\sqrt{3}-\sqrt{2}\right)^2.$$

(11) $IRB(D_nP_n) = MKA^1_{\frac{1}{2},2}(D_nP_n) = \left[\left(1-\sqrt{3}\right)^2 2 + 24 + \left(\sqrt{2}-\sqrt{3}\right)^2 48 + \left(\sqrt{3}-2\right)^2 8\right]n$

$$-\left(\sqrt{2}-\sqrt{3}\right)^2 6.$$

III. Results for Propyl Ether Imine Dendrimer *PETIM*

We consider the family of propyl ether imine dendrimers. This family of dendrimers is denoted by *PETIM*. The molecular graph of *PETIM* is depicted in Figure 2.

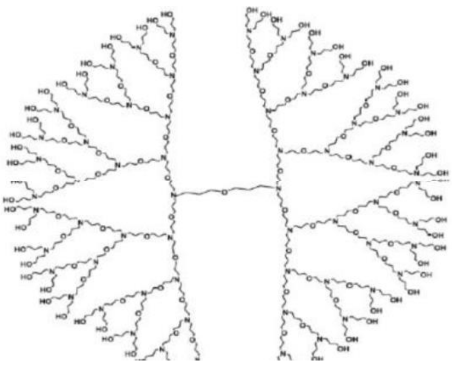

Figure 2. The molecular graph of *PETIM*

Let G be the molecular graph of *PETIM*. By calculation, we find that G has $24\times2^n - 23$ vertices and $24\times2^n - 24$ edges. In *PETIM*, there are three types of edges based on degrees of end vertices of each edge as given in Table 2.

$d_G(u), d_G(v) \setminus uv \in E(G)$	(1, 2)	(2, 2)	(2, 3)
Number of edges	2×2^n	$16 \times 2^n - 18$	$6 \times 2^n - 6$

Table 2. Edge partition of *PETIM*

In the following theorem, we compute the minus (a,b)-KA index of *PETIM*.

Theorem 2. The minus (a,b)-KA index of *PETIM* is

$$MKA^1_{a,b}(PETIM) = (|1^a - 2^a|)^b 2\times2^n + (|2^a - 3^a|)^b (6\times2^n - 6).$$

Proof: From definition and by using Table 2, we derive

$$MKA^1_{a,b}(PETIM) = \sum_{uv\in E(G)}\left[\left|d_G(u)^a - d_G(v)^a\right|\right]^b$$
$$= \left(\left|1^a - 2^a\right|\right)^b 2\times 2^n + \left(\left|2^a - 2^a\right|\right)^b \left(16\times 2^n - 18\right) + \left(\left|2^a - 3^a\right|\right)^b \left(6\times 2^n - 6\right)$$
$$= \left(\left|1^a - 2^a\right|\right)^b 2\times 2^n + \left(\left|2^a - 3^a\right|\right)^b \left(6\times 2^n - 6\right).$$

From Theorem 2, we establish the following results.

Corollary 2. 1. Let *PETIM* be the family of propyl ether imine dendrimers. Then

(1) $\alpha_1(PETIM) = MKA^1_{1,1}(PETIM) = 8\times 2^n - 6.$

(2) $MF(PETIM) = MKA^1_{2,1}(PETIM) = 36\times 2^n - 30.$

(3) $\sigma(PETIM) = MKA^1_{1,2}(PETIM) = 8\times 2^n - 6.$

(4) $\alpha_{-1}(PETIM) = MKA^1_{-1,1}(PETIM) = 2\times 2^n - 1.$

(5) $\alpha_{-\frac{1}{2}}(PETIM) = MKA^1_{-\frac{1}{2},1}(PETIM) = \left(1+\sqrt{2}-\sqrt{3}\right)2\times 2^n - \left(\sqrt{3}-\sqrt{2}\right)6.$

(6) $\alpha_{\frac{1}{2}}(PETIM) = MKA^2_{\frac{1}{2},1}(PETIM) = \left(3\sqrt{3}-2\sqrt{2}-1\right)2\times 2^n - \left(\sqrt{3}-\sqrt{2}\right)6.$

(7) $M_i^a(PETIM) = MKA^1_{1,a}(PETIM) = \left(\left|1-2\right|\right)^a 2\times 2^n + \left(\left|2-3\right|\right)^a (6\times 2^n - 6).$

(8) $\alpha_{-2}(PETIM) = MKA^1_{-2,1}(PETIM) = \frac{7}{3}\times 2^n - \frac{5}{6}.$

(9) $\alpha_a(PETIM) = MKA^1_{a,1}(PETIM) = \left(\left|1-2^a\right|\right)2\times 2^n + \left(\left|2^a - 3^a\right|\right)(6\times 2^n - 6).$

(10) $IRA(PETIM) = MKA^1_{-\frac{1}{2},2}(PETIM) = \left[\left(\sqrt{2}-1\right)^2 + \left(\sqrt{3}-\sqrt{2}\right)^2\right]2^n - \left(\sqrt{3}-\sqrt{2}\right)^2.$

(11) $IRB(PETIM) = MKA^1_{\frac{1}{2},2}(PETIM) == \left[\left(\sqrt{2}-1\right)^2 + 3\left(\sqrt{3}-\sqrt{2}\right)^2\right]2\times 2^n - \left(\sqrt{3}-\sqrt{2}\right)^2 6.$

IV. Results for Poly Ethylene Amide Amine Dendrimer *PETAA*

We consider the family of poly ethylene amide amine dendrimers. This family of dendrimers is denoted by *PETAA*. The molecular graph of *PETAA* is presented in Figure 3.

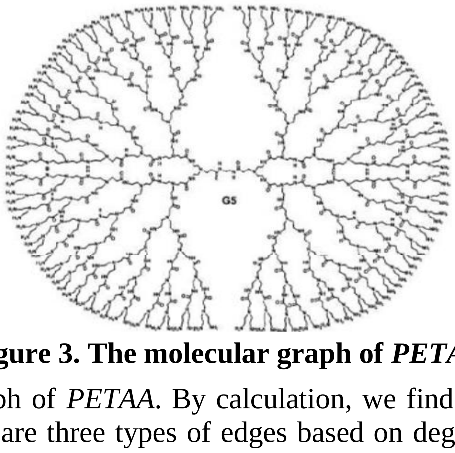

Figure 3. The molecular graph of *PETAA*

Let G be the molecular graph of *PETAA*. By calculation, we find that G has $44\times2^n - 18$ vertices and $44\times2^n - 19$ edges. In *PETAA*, there are three types of edges based on degrees of end vertices of each edge as given in Table 3.

$d_G(u), d_G(v) \setminus uv \in E(G)$	(1, 2)	(1, 3)	(2, 2)	(2, 3)
Number of edges	4×2^n	$4\times 2^n - 2$	$16\times 2^n - 8$	$20\times 2^n - 9$

Table 3. Edge partition of *PETAA*

In the following theorem, we determine the minus (*a*,*b*)-*KA* index of *PETAA*.

Theorem 3. Let *PETAA* be the family of poly ethylene amide amine dendrimers. Then

$$MKA_{a,b}^{1}(PETAA) = \left(\left|1^a - 2^a\right|\right)^b 4\times 2^n + \left(\left|1^a - 3^a\right|\right)^b (4\times 2^n - 2) + \left(\left|2^a - 3^a\right|\right)^b (20\times 2^n - 9).$$

Proof: By using definition and Table 3, we obtain

$$MKA_{a,b}^{1}(PETAA) = \sum_{uv\in E(G)} \left[\left|d_G(u)^a - d_G(v)^a\right|\right]^b$$

$$= \left(\left|1^a - 2^a\right|\right)^b 4\times 2^n + \left(\left|1^a - 3^a\right|\right)^b (4\times 2^n - 2) + \left(\left|2^a - 2^a\right|\right)^b (16\times 2^n - 8) + \left(\left|2^a - 3^a\right|\right)^b (20\times 2^n - 9)$$

$$= \left(\left|1^a - 2^a\right|\right)^b 4\times 2^n + \left(\left|1^a - 3^a\right|\right)^b (4\times 2^n - 2) + \left(\left|2^a - 3^a\right|\right)^b (20\times 2^n - 9).$$

From Theorem 3, we establish the following results.

Corollary 3.1. Let *PETAA* be the family of propyl ether imine dendrimers. Then

(1) $\alpha_1(PETAA) = MKA_{1,1}^{1}(PETAA) = 32\times 2^n - 13.$

(2) $MF(PETAA) = MKA_{2,1}^{1}(PETAA) = 144\times 2^n - 61.$

(3) $\sigma(PETAA) = MKA_{1,2}^{1}(PETAA) = 40\times 2^n - 17.$

(4) $\alpha_{-1}(PETAA) = MKA_{-1,1}^{1}(PETAA) = 8\times 2^n - \frac{17}{6}.$

(5) $\alpha_{-\frac{1}{2}}(PETAA) = MKA_{-\frac{1}{2},1}^{1}(PETAA) = \left(1 - \frac{1}{\sqrt{2}}\right)4\times 2^n + \left(1 - \frac{1}{\sqrt{3}}\right)(4\times 2^n - 2)$

$$+\left(\frac{1}{\sqrt{2}} - \frac{1}{\sqrt{3}}\right)(20\times 2^n - 9).$$

(6) $\alpha_{\frac{1}{2}}(PETAA) = MKA_{\frac{1}{2},1}^{2}(PETAA) =$

$$= \left(\sqrt{2} - 1\right)4\times 2^n + \left(\sqrt{3} - 1\right)(4\times 2^n - 2) + \left(\sqrt{3} - \sqrt{2}\right)(20\times 2^n - 9).$$

(7) $M_i^a(PETAA) = MKA_{1,a}^{1}(PETAA) = \left(\left|1 - 2\right|\right)^a 2\times 2^n + \left(\left|2 - 3\right|\right)^a (6\times 2^n - 6).$

(8) $\alpha_{-2}(PETAA) = MKA_{-2,1}^{1}(PETAA) = \frac{26}{3}\times 2^n - \frac{109}{36}.$

(9) $\alpha_a(PETAA) = MKA_{a,1}^{1}(PETAA)$

$$= \left(\left|1 - 2^a\right|\right)4\times 2^n + \left(\left|1 - 3^a\right|\right)(4\times 2^n - 2) + \left(\left|2^a - 3^a\right|\right)(20\times 2^n - 9).$$

(10) $IRA(PETAA) = MKA_{-\frac{1}{2},2}^{1}(PETAA) = \left(1 - \frac{1}{\sqrt{2}}\right)^2 4\times 2^n + \left(1 - \frac{1}{\sqrt{3}}\right)^2 (4\times 2^n - 2)$

$$+\left(\frac{1}{\sqrt{2}} - \frac{1}{\sqrt{3}}\right)^2 (20\times 2^n - 9).$$

(11) $IRB(PETAA) = MKA_{\frac{1}{2},2}^{1}(PETAA)$

$$= \left(\sqrt{2} - 1\right)^2 4\times 2^n + 3\left(\sqrt{3} - 1\right)(4\times 2^n - 2) + \left(\sqrt{3} - \sqrt{2}\right)^2 (20\times 2^n - 9).$$

V. Results for Zinc Prophyrin Dendrimer DPZ_n

We consider the family of zinc prophyrin dendrimers. This family of dendrimers is denoted by DPZ_n, where n is the steps of growth in this type of dendrimers. The molecular graph of DPZ_n is shown in Figure 4.

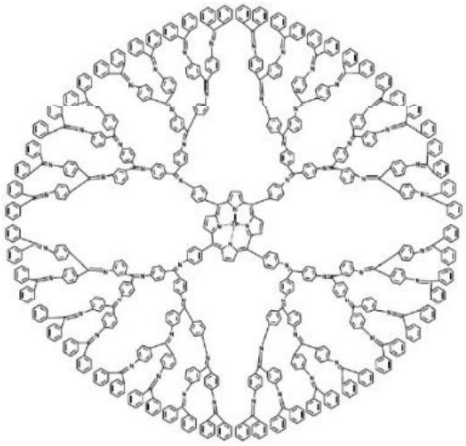

Figure 4. The molecular graph of DPZ_n

Let G be the molecular graph of DPZ_n. By calculation, we obtain that G has $56\times2^n - 7$ vertices $64\times2^n - 4$ edges. In DPZ_n, there are four types of edges based on degrees of end vertices of each edge as given in Table 4.

$d_G(u), d_G(v) \setminus uv \in E(G)$	(2, 2)	(2, 3)	(3, 3)	(3, 4)
Number of edges	$16\times2^n - 4$	$40\times2^n - 16$	$8\times2^n + 12$	4

Table 4. Edge partition of DPZ_n

In the following theorem, we determine the minus $(a, b)KA$ index of DPZ_n.

Theorem 4. Let DPZ_n be the family of zinc prophyrin dendrimers. Then
$MKA_{a,b}^{1}(DPZ_n) = \left(\left|2^a - 3^a\right|\right)^b \left(40\times 2^n - 16\right) + \left(\left|3^a - 4^a\right|\right)^b 4.$

Proof: From definition and by using Table 4, we deduce

$$MKA_{a,b}^{1}(DPZ_n) = \sum_{uv\in E(G)} \left[\left|d_G(u)^a - d_G(v)^a\right|\right]^b$$

$$= \left(\left|2^a - 2^a\right|\right)^b \left(16\times 2^n - 4\right) + \left(\left|2^a - 3^a\right|\right)^b \left(40\times 2^n - 16\right) + \left(\left|3^a - 3^a\right|\right)^b \left(8\times 2^n + 12\right) + \left(\left|3^a - 4^a\right|\right)^b 4$$

$$= \left(\left|2^a - 3^a\right|\right)^b \left(40\times 2^n - 16\right) + \left(\left|3^a - 4^a\right|\right)^b 4.$$

From Theorem 4, we establish the following results.

Corollary 4.1. Let DPZ_n be the family of zinc prophyrin dendrimers. Then

(1) $\alpha_1\left(DPZ_n\right) = MKA_{1,1}^{1}\left(DPZ_n\right) = 40\times 2^n - 12.$

(2) $MF\left(DPZ_n\right) = MKA_{2,1}^{1}\left(DPZ_n\right) = 200\times 2^n - 52.$

(3) $\sigma\left(DPZ_n\right) = MKA_{1,2}^{1}\left(DPZ_n\right) = 40\times 2^n - 12.$

(4) $\alpha_{-1}(DPZ_n) = MKA^{1}_{-1,1}(DPZ_n) = \frac{20}{3}\times 2^n - \frac{7}{3}.$

(5) $\alpha_{-\frac{1}{2}}(DPZ_n) = MKA^{1}_{-\frac{1}{2},1}(DPZ_n) = \left(\frac{1}{\sqrt{2}} - \frac{1}{\sqrt{3}}\right)40\times 2^n - \left(\frac{16}{\sqrt{2}} - \frac{20}{\sqrt{3}} + 2\right).$

(6) $\alpha_{\frac{1}{2}}(DPZ_n) = MKA^{2}_{\frac{1}{2},1}(DPZ_n) = \left(\sqrt{3}-\sqrt{2}\right)40\times 2^n - \left(16\sqrt{2} - 20\sqrt{3} + 8\right).$

(7) $M_i^a(DPZ_n) = MKA^{1}_{1,a}(DPZ_n) = \left(|2-3|\right)^a(40\times 2^n - 16) + \left(|3-4|\right)^a 4.$

(8) $\alpha_{-2}(DPZ_n) = MKA^{1}_{-2,1}(DPZ_n) = \frac{50}{9}\times 2^n - \frac{73}{36}.$

(9) $\alpha_a(DPZ_n) = MKA^{1}_{a,1}(DPZ_n) = \left(|2^a - 3^a|\right)(40\times 2^n - 16) + \left(|3^a - 4^a|\right)4.$

(10) $IRA(DPZ_n) = MKA^{1}_{-\frac{1}{2},2}(DPZ_n) == \left(\frac{1}{\sqrt{2}} - \frac{1}{\sqrt{3}}\right)^2 40\times 2^n - \left(\frac{1}{\sqrt{2}} - \frac{1}{\sqrt{3}}\right)^2 16 + \left(\frac{1}{\sqrt{3}} - \frac{1}{2}\right)^2 4.$

(11) $IRB(DPZ_n) = MKA^{1}_{\frac{1}{2},2}(DPZ_n) = \left(\sqrt{2}-\sqrt{3}\right)^2 40\times 2^n - \left(\sqrt{2}-\sqrt{3}\right)^2 16 + \left(\sqrt{3}-2\right)^2 4.$

VI. Comparative Analysis

The comparative analysis of Figures 5 and 6, show plotting of Adriatic indices, which are special case of Adriatic (*a*, *b*)-*KA* index for some special values of *a* and *b* for dendrimers D_nP_n, PETIM, PETAA and DPZ_n. The co-efficient of correlation of these Adriatic indices are close to each other. Especially, the co-efficient of correlation of Adriatic (*a, b*)-*KA* index of dendrimers D_nP_n is one and it shows that the best fit.

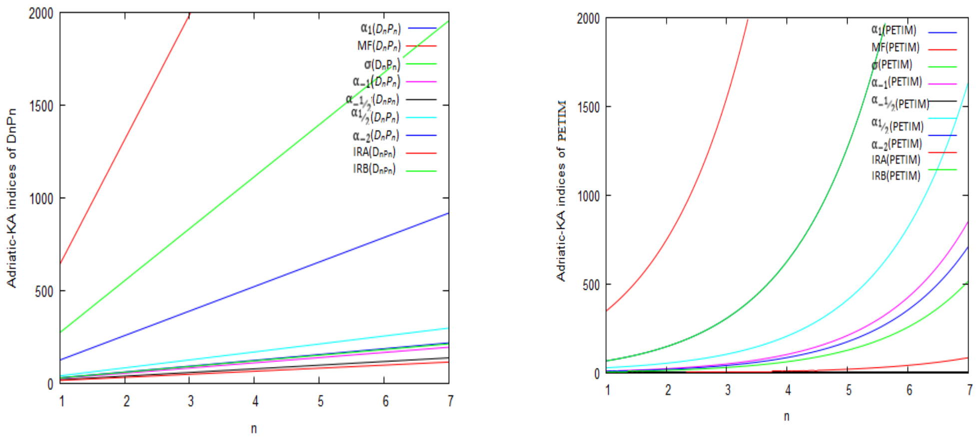

Figure-5. Plot of Adriatic-KA indices for D_nP_n and PETIM

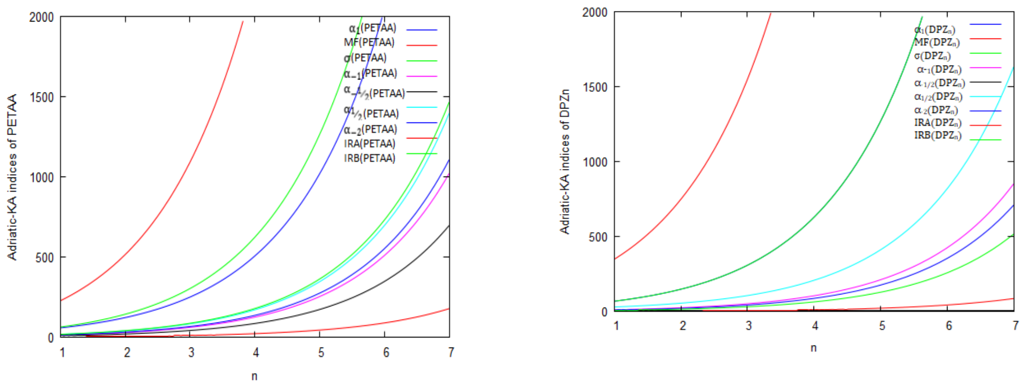

Figure-6. Plot of Adriatic-KA indices for PETAA and DPZ_n

CONCLUSION

In this study, we have defined the discrete Adriatic (a, b) - KA index of a molecular graph. Furthermore, we have computed the Adriatic (a, b)-KA index for certain dendrimers. Also we obtained some other Adriatic indices directly as a special case of Adriatic (a, b) - KA index for some special values of a and b.

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