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QSPR STUDY OF A GROUP OF 1,3,4 THIADIAZOLE AND 1,3,4 THIADIAZOLINE DISULFONAMIDS WITH BIOLOGICAL ACTIVITY LOG BCA 1V

KEYWORDS

Qspr Study Of A Group Of 1,3,4 Thiadiazole And 1,3,4 Thiadiazoline Disulfonamids With Biological Activity log BCA IV.

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ABSTRACT *In the present investigation the applicability of various physicochemical parameters are tested for the QSPR study on 1,3,4 Thiadiazole and 1,3,4 Thiadiazoline Disulfonamides, the regration analysis shown that even in the multi parameters correlation of physicochemical parameters give singificant regration coefficiant further more writing combination of physicochemical parameters along with the indicater parameters, a tremendous improvement in the statistics has been observed the result are critically discussed on the basis regration data.*

INTRODUCTION –

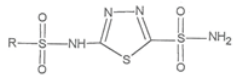
Quantitative structure- property-activity relationship (QSPR/QSAR) have been stablished as powerful research tool & are being used in many fields, there are mathematical models in that property & activities of molecules are predicted from their structure 1,3,4 Thiadiazole-2 Sulfonamide and there derivatives are used for clinical purpose. They are being used age divureties [8-11], antiglucoma agents, anti epilopic agents [14] and anitiulcer agents [15].

The major biological activity of acetazolamide and related hetrocyclic/ aromatic sulfonamides is connected with the powerful inhibition of the zinc enzyme carbonic anhydrase [16-20].

Supram et al[21]. have reported Quantum chemical QSAR of a group of 1,3,4 diazole and 1,3,4 thiadiazoline disulfonamides with carbonic anhydrase inhibitory properties.

Agrawal and Khadikar [22] have used topological indices for modeling inhibitory activity of various CA inhibitors. they also proposed statistically significant models for modeling estimating and predicting in inhaibitory activities of CA¬-inhibitors.

The general structure of CA inhibitors used in our work are given below :-



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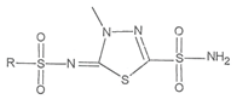

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Materials & Methods -

The study was carried on the compounds prepared by supuran et al they have used activities of a group of 1,3,4 Diazole and 1,3,4 Thiadiazolene disulfonamides with Log BCA IV.

Parameters used -

We have used chemsketch program of ACD Lab for calculation of various physicochemical parameters like molecular weight (MW), molar refraction (MR), Molar volume (MV), Parachor(PR), Surface Tension(γ), Density (D), Polarizability ( ) & index of refraction (N), The calculation of parameters for all 40 compounds.

Correlation Matrix

We have studied the inter correlation of the parameters along with the biological activity & indicator parameters, parameters MW, MR, MY, PR and are the parameters which show good correlation with IC50 (nm) (Log HCAI) inhibitory activity.

Result & Discussion -

A set of 40 Thiadiazole and Thiadiazoline disulfonamides with Carbonic Anhydrase inhibitory properties are taken from the work of Supran et al.22. The structural details of these compounds along with their biological activities log BCA IV are reported table. This table also records the value of three indicators parameters which are dummy parameters responsible for substitution at R, IP, has been taken as unity if the compounds belong C type. IP2 has been taken as unity if the compounds belong to E type and IP3 is taken as unit if R vis mono substituented on all other cases they are given zero value.

Parameters which can be used for modeling the log (BCA IV) activity the multi parameteric.

Then a five parametric correlation is found to be the best Result R = 0.9679 this model includes on addistional parameters . Figure 1 -

Log BCAIV= -0.0786 (0.0194) MW+ 6.4931 (5.4735)
MR-0.0711 (0.0272)MV + 9.8592 ´10-4(5.6966´10^{-4})
PR-18.3297 (6.061) N-158752 (13.8278)
α-0.1956(0.8160)IP3+30.9474
N=40 Se= 0.2172 R = 0.9232 F = 23.081 Q = 4.2505

Comparison of observed and estimated log IC50 (nM) (BCAIV) using model.

Compd. No.	Observed (BCAIV)	log IC50 (nM) (BCA IV)	
		Model- 24	Residue
1.	0.6989	0.7340	-0.0351
2.	0.7782	0.8980	-0.1198
3.	0.4741	0.6920	-0.2179
4.	0.8451	0.7110	0.1341
5.	0.6989	0.7260	-0.0271
6.	0.6021	0.7280	-0.1259
7.	0.6021	0.7870	-0.1849
8.	1.9031	0.9530	-0.0499
9.	0.6989	0.6480	0.0509
10.	0.8451	0.8020	0.0431
11.	0.3010	-	-
12.	0.0000	-	-
13.	0.602	-	-
14.	1.1139	0.8200	0.2939
15.	-0.2218	-	-
16.	1.0000	0.8820	0.1180
17.	2.5051	2.4110	-0.0941
18.	1.4472	-	-
19.	0.8451	1.0230	-0.1779

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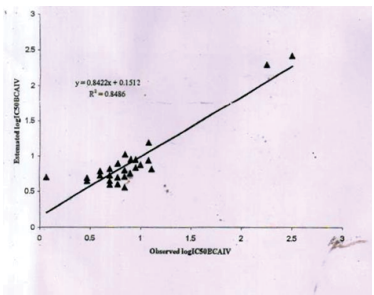
20.	1.0792	0.9420	0.372
21.	0.9031	0.9520	-0.0489
22.	0.9542	0.8380	0.1162
23.	0.4741	0.6450	-0.1109
24.	0.8451	0.5560	0.2891
25.	0.6989	0.5960	0.1029
26.	0.7782	0.6030	0.1752
27.	0.6989	0.7330	-0.0341
28	0.3010	-	-
29.	0.0969	-0.9550	1.0519
30.	0.0691	0.7000	-0.6309
31.	0.7782	0.700	0.0782
32.	0.6989	-	-
33.	0.4777	-	-
34.	0.9031	-	-
35.	-0.3010	-	-
36.	1.0791	1.1900	-0.1109
37.	2.2552	2.2840	-0.0288
38.	0.9000	0.7600	0.1400
39.	0.6989	0.8200	-0.1231
40.	0.9500	0.9520	-0.0020

Graph-



Comparison of observed and estimated log IC50 (nM) (BCAIV) using model.

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