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On the Retention Index

Recently, several works[1a-f] were carried out to examine the correlation between the molecular structure and retention index in the gas liquid chromatography. In this communication, we compared the retention indices of monosubstituted benzene, *meta*- and *para*-substituted toluene derivatives[2] with several molecular electronic indices obtained in the previous papers,[3] and found that the retention indices were linear with the free radical superdelocalizabilities $S_r^{(R)}$ (*cf.* Tables I, II and III: Fig. 1, 2) on the ring carbon atoms.

These results afford the valuable informations on the interaction between the sample molecule and stationary phase. The detail work will be published in due time.

Table I. Excess Free Radical Superdelocalizabilities $\Delta S_r^{(R)}$ of Monosubstituted Benzenes

Substituent	C-Subst.	*ortho*	*meta*	*para*
NH_2	−0.05381	+0.10300	+0.00129	+0.08597
OMe	−0.03731	+0.06990	+0.00153	+0.05794
Me	−0.00540	+0.01036	+0.00304	+0.00842
Cl	−0.00729	+0.01653	+0.00280	+0.01362
Br	−0.00643	+0.01989	+0.00276	+0.01701
CO_2Me	−0.06918	+0.12511	−0.00062	+0.10438
CHO	−0.08063	+0.18568	−0.00138	+0.16062
NO_2	−0.08514	+0.52083	−0.00215	+0.49219

$\Delta S_r^{(R)} = S_r^{(R)} - 0.83000$

Table II. Sum of Excess Free Radical Superdelocalizabilities $\sum \Delta S_r^{(R)}$ of Monosubstituted Benzenes

Substituent	$\sum \Delta S_r^{(R)}$	Substituent	$\sum \Delta S_r^{(R)}$
NH_2	+0.24074	H	0.00000
OMe	+0.16349	CO_2Me	+0.28418
Me	+0.02982	CHO	+0.26429
Cl	+0.04497	NO_2	+0.92573
Br	+0.05597		

Table III. Sum of Excess Free Radical Superdelocalizabilities $\sum \Delta S_r^{(R)}$ of Substituted Toluene Series

Substituent	$\sum \Delta S_r^{(R)}$	Substituent	$\sum \Delta S_r^{(R)}$
NH_2	+0.27056	Br	0.08577
OMe	0.19331	H	0.02982
Me	0.05964	CO_2Me	0.31400
Cl	0.07479		

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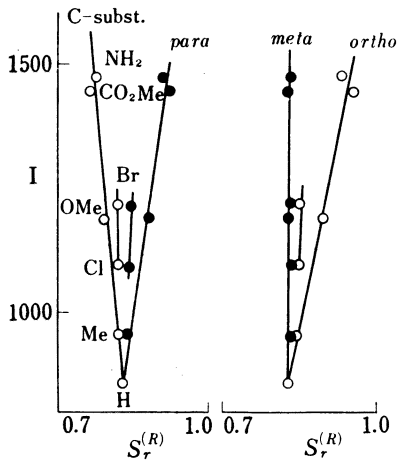

Fig. 1. Correlations between Retention Indices I and Free Radical Superdelocalizabilities $S_r^{(R)}$ on the Ring Carbon of Monosubstituted Benzenes

stationary phase: Emulphor-O; temp.: 150°

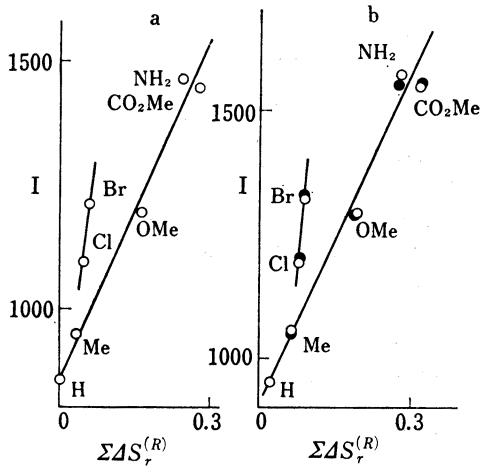

Fig. 2. Correlations between Retention Indices I and Sum of Excess Free Radical Superdelocalizabilities $\sum\Delta S_r^{(R)}$

stationay phase: Emulphor-O; temp.: 150°
a: monosubstituted benzenes
b: *meta*- and *para*-substituted toluene series
meta: ○ *para*: ●

Faculty of Pharmaceutical Sciences,
Kyoto University
Yoshida-Shimoadachi, Sakyo-ku, Kyoto

Toyozo Uno
Hideki Okuda

Faculty of Pharmaceutical Sciences,
Osaka University
Toneyama 6-1-1, Toyonaka, Osaka

Yoshio Sasaki
Miyoko Suzuki

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Synthesis and Properties of 8,2′-Cyclothioguanosine and Related Compounds

Recently, the synthesis and properties of a variety of adenosine-8-cyclonucleosides have been reported.[1-4] These cyclonucleosides are important intermediates for the transformation of ribonucleosides to deoxynucleosides or arabinonucleosides. However, because of the difficulty of application of mono-tosylation or mono-triisopropylbenzenesulfonylation to guanine nucleosides,[5] 8,2′-cyclothioguanosine derivatives have not hitherto been reported.

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