Journal of Chromatography, 93 (1974) 253–254

CHROM. 7402

Letter to the Editor

Specific surface area of GLC column packings as a function of stationary phase volume

Sir,

In reply to Dr. R. N. Nikolov's letter commenting on our recent paper[1], we would make the following points.

The first comment is connected with eqn. 4 in our paper. It can be shown easily by considering eqns. 3 and 7 that there is a misprint (the subscript L was omitted from the surface area S) and $S_L = S_s$ is the correct form of eqn. 4. We are grateful to Dr. Nikolov for pointing out this misprint and we would like to apologize to the readers of the journal for this error.

The second comment concerns eqns. 7, 8, 11 and 12. These equations reflect the dependence of the surface area of the sorbent on the volume of the stationary phase.

The difference between our concept and that suggested by Nikolov consists in a different determination of the value of the minimum pore diameter of the solid support, $\delta_{\text{min.}}$, for which eqn. 6, $V_L = \omega\delta - v$, is still valid. The boundary value of $\delta_{\text{min.}} = v/\omega$ is accepted in our work and is obtained from the condition that $V_L = 0$. In Nikolov's opinion, $V_L = V_{L\,\text{min.}} \neq 0$ should be accepted as the initial condition for the determination of $\delta_{\text{min.}}$. Then, $\delta_{\text{min.}} = \dfrac{V_{L\,\text{min.}} + v}{\omega}$ and, consequently,

$$S = S^+ - 4\omega \ln[(V_L + v)/(V_{L\,\text{min.}} + v)]$$

in contrast to eqn. 7:

$$S = S^+ - 4\omega \ln[(V_L + v)/v]$$

The fact that eqn. 11, obtained under a series of simplifying initial and additional conditions, is in good agreement with the experimental results for values of $V_L \geqslant \bar{V}_L$, $\bar{V}_L = 0.05$–0.1 ml/g, is considered to be the basis for the above modification of eqn. 7 of our work. However, the fact mentioned above does not provide sufficient reason for considering the value of $\bar{V}_L$, which limits the range of application of eqn. 11, to be also the value that is boundary for eqn. 6. The validity of eqn. 6 is considered to be only one of a series of assumptions simplifying the real state. It is perfectly possible that $V_{L\,\text{min.}} \ll \bar{V}_L$.

In conclusion, we should like to mention that our study was not suggested as a method to replace porosimetry or other well established methods, but our opinion was "as chromatographic methods are commonly used for determining specific surface areas of sorbents in many laboratories, we think it useful to consider the possible use of these data for obtaining further structural information".

A. V. Topchiev Institute for
Petrochemical Synthesis,
Academy of Sciences of the USSR,
Moscow (U.S.S.R.)

V. BEREZKIN

Institute of Instrumental Analytical Chemistry, Czechoslovak
Academy of Sciences,
Brno (Czechoslovakia)

M. KREJČÍ

1 V. G. Berezkin, D. Kouřilová, M. Krejčí and V. M. Fateeva, *J. Chromatogr.*, 78 (1973) 261.