Application Note 108

New Capability for the GeoPyc Makes Visible the Percent of the Dry*Flo* Bed Occupied by the Sample

If too little sample is used with the GeoPyc® Envelope Density Analyzer, poor reproducibility of results will occur. The instrument is simply unable to distinguish between a Dry*Flo*® bed with sample and one without sample when the sample volume occupies too small a percentage of the total bed. For optimum performance, the sample should occupy a minimum of 20% of the Dry*Flo* bed. A larger percentage of sample is preferable as long as it can be surrounded sufficiently by Dry*Flo*. To make the sample percent visible, Micromeritics has incorporated into version 2.00 of the GeoPyc software a calculation for the percent of bed volume occupied by the sample.

Utilizing this capability requires that each sample cell be calibrated without Dry*Flo* or sample to determine the "zero bed" volume. This information is stored internally and thereafter the percent sample volume is reported with each analysis. The operator can then use this number to optimize the quantity of sample necessary to meet a specific reproducibility criteria.

The table and graph on page 2 show the typical effect of sample quantity on the reproducibility of results. The sample used in this example was composed of varying quantities of nonporous glass spheres 6 mm in diameter. The analyses were conducted using a 25.4-mm diameter sample cell. The absolute density of the spheres was 2.5202 g/cm^3 as measured by Micromeritics' AccuPyc 1330. Being nonporous, the envelope density of the spheres was also 2.5202 g/cm^3. As shown, this value is achieved within 1% when the sample occupies more than 7.5% of the total bed volume. Other materials will exhibit similar behavior but may not follow this exact pattern.

mi micromeritics®

% Sample Volume	Envelope Density	% Error
0.537	2.8223	+11.99
1.228	2.5416	+0.85
1.284	2.4177	-4.07
1.299	2.3913	-5.11
1.944	2.3903	-5.15
3.012	2.5419	+0.86
4.782	2.5518	+1.25
5.761	2.5699	+1.97
7.523	2.5288	+0.34
9.616	2.5269	+0.27
12.547	2.5386	+0.73
14.063	2.5193	-0.04
15.538	2.5041	-0.64
18.039	2.5184	-0.07
18.335	2.5089	-0.45
18.706	2.5155	-0.19
20.333	2.5153	-0.19
29.708	2.5289	+0.35