Surface Area and Porosity Determinations by Physisorption

Measurements and Theory

Second Edition

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Contents

README first—Organization of this book

This book is organized with the most rudimentary material at the beginning and continues with the more sophisticated material at the end. In this sense it could be considered a textbook, and in fact it was originally designed to be such. As with all textbooks, it is not recommended to start reading in the middle, or to use material at the beginning to do complex analysis that is described later in the book. For example, it would be ill-advised to try to do pore size distribution calculations by simply skipping to Chapter 6 without the background information about the quantum mechanically (QM) derived χ (ESW) theory.[1] It would also not be very accurate to use only the standard curve method to determine porosity, although this might be useful. (This would be taking advantage of the fact that the χ theory breaks the dependence of the standard curve method upon a matching non-porous standard, thus getting around the problem that it is nearly impossible to find a matching non-porous sample.) Thus, if you only read enough of this book to use the χ theory in the standard curve method, then this will not be sufficient today to publish your analysis in the open literature.

My advice, if you only want to use the QM derived χ theory, is to skip the portions of the book that deal with the older theories and just study the relevant χ theory sections. Furthermore, if you are uneasy regarding QM, then simply trust the final χ equation that is derived and skip the QM portion. (When you get to this point, there is a note telling you to do this.)

[1] The χ theory (in a few reports listed as "CFS"), the Auto Shielding Physisorption (ASP) theory, the Disjoining Pressure Theory, and the Excess Surface Work (ESW) theory are all fundamentally the same theory, and will usually be referred to as simply χ theory. Each has approached the problem from a different viewpoint but ends up with the same isotherm equation. This makes it problematic if one searches using keywords, and one therefore needs to use all of these terms.