Comparative Methods For The Pore Size Distribution

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A comparison of two methods of estimating the soil pore network available to protozoa Elsevier
The Second IUPAC Symposium on the Characterization of Porous Solids (COPS-II) provided the opportunity for detailed discussion and appraisal of the most important techniques currently used for the characterization of porous materials, especially those of technological importance. The 82 selected papers and reviews contained in this volume are mainly concerned with the theoretical and experimental aspects of adsorption, fluid penetration, small-angle scattering and spectroscopic methods with their application in the study of adsorbents, catalysts, constructional materials, etc. Particular attention is given to the characterization of carbons, oxides, zeolites, clays, cement and polymers. The wide range of materials and techniques described in this book provide a useful and comprehensive reference source for academic and industrial scientists and technologists.

Management of Saline Soils and Waters Elsevier
A comprehensive overview of the key geologic, geomechanical and engineering principles that govern the development of unconventional oil and gas reservoirs. Covering hydrocarbon-bearing formations, horizontal drilling, reservoir seismology and environmental impacts, this is an invaluable resource for geologists, geophysicists and reservoir engineers.
Sodium-Ion Batteries Elsevier
Porous materials, Porosity measurement, Gases, Adsorption, Testing conditions, Low-temperature testing, Specimen preparation, Test equipment, Mathematical calculations, Nitrogen, Comparative tests
Trace Elements in Soil Pore Water Elsevier
A thumb print left at the scene of a grisly murder. Fingerprints taken from a getaway car used in a bank robbery. A palm print recovered from the shattered glass door of a burglarized home. Indeed, where crimes are committed, careless perpetrators will invariably leave behind the critical pieces of evidence most likely in the form of fingerprints n

Mesoporous Molecular Sieves 1998 Springer
This thesis examined a range of methods for sampling soil pore water to investigate the chemistry of trace elements. In particular, the study assessed whether Rhizon samplers, centrifugation, high pressure squeezing and soil suspensions in simulated pore water can be viable approaches for obtaining representative samples of equilibrated soil pore water. Results for metal solubility and speciation were interpreted in terms of both soil morphological effects on trace metal dynamics and artefacts introduced at various stages during sample preparation and handling. The main soil used in the study was an organic-rich sandy silt from a site which has served as a sewage re-processing facility for almost a century. This soil was chosen because of its importance as a long-term repository for metal-enriched sludge applied to arable land, providing a suitable medium on which to study trace metal behaviour. Pore waters were extracted and analysed for major and trace cations and anions, pH, Dissolved Inorganic Carbon (DIC) and Dissolved Organic Carbon (DOC) at two different temperatures (5 degrees Celsius and 15 degrees Celsius), in order to evaluate the extent of bacterial activity, organic decomposition and their consequences on solute

composition, during pore water extractions. Speciation was estimated from analysis of pore water chemistry using two software packages (PHREEQCi and WHAM-VI). Pore waters showed different ranges of concentration between the various methods. Different mechanisms and/or chemical reactions were involved during the different extractions; a range of processes was identified, mainly dominated by metal complexation by humus acids and redox reactions. Results revealed that the soil studied was able to partially buffer the free ion activities of the metal ions in pore water with increasing dilutions, but demonstrated virtually no ability to buffer DOC. Identification of the source (i.e. location of pore space) of water extracted was also investigated using water with different isotopic composition (18O/16O). Evidence showed that centrifugation was not able to differentiate between more and less mobile water at FC conditions, rather enhancing the mixing between the two pools of water (native and labelled) by and apparent process of infusion . By contrast, Rhizon samplers appeared to sample water preferentially from the more accessible pool (extra-aggregate), which proved to have a composition showing incomplete mixing with the native water. The results also suggested that mixing of the two pools was rather fast and that was almost completely attained prior to pore water extraction. The study established that the most important factors affecting pore water chemistry during extraction are the conditions to which the samples are exposed during the extraction process. For these reasons Rhizon samplers should be used as a disposable device, and are only applicable for use in high soil moisture soil contents. In contrast, they present no side-effects (providing enough equilibration time) if M2+ (free ion activity) were needed as opposed to Msol (total metal concentration in pore water), as often required in environmental studies. Centrifugation is optimal for bulk solution studies, or when homogenisation represents a key experimental point; targeted studies are also possible. Soil squeezing is subject to severe limitations in the case of prolonged extractions of biologically active soils, due to the effects of anaerobism. Squeezing should only be used for fast extractions of soils. Finally, batch extractions are well suited to studies on M2+ equilibria, but more studies are needed to clarify the effect of soil: solution ratio on metal and DOC solubility.

Quantitative-Qualitative Friction Ridge Analysis Springer Science & Business Media

The development of nanomaterials plays a fundamental role in current and future technology applications, particularly nanomaterials that have multiple functionalities. This book provides a broad overview of the effect of nanostructuring in the multifunctionality of different widely studied nanomaterials. This book is divided into four sections constituting a road map that groups materials sharing certain types of nanostructuring, including nanoporous, nanoparticled, 2D laminar nanomaterials, and computational methods for characterizations of nanostructures. This structured approach in nanomaterials research will serve as a valuable reference material for chemists, (bio)engineers, physicists, nanotechnologists, undergraduates, and professors.

Systematics and Evolution BoD – Books on Demand

Using the principles set forth in percolation theory and critical path analysis (CPA), this thesis presents a method for constraining parameterized values of critical pore size and a cumulative volumetric density function using the shape and scale of accessibility functions and a mercury intrusion capillary pressure (MICP) data set. Constraints can be made without an independent pore size distribution measurement. These parameters can be combined with the percolation threshold corrected for finite sample size and electrical formation factor to determine permeability and to approximate pore size distribution. The analysis uses predetermined permeability, porosity, and formation factor values in Berea Sandstone and Racine Dolomite core samples to initially quantify parametrization values. The analysis also compares two methods of deriving critical pore size using the Washburn equation and using parameterized values. The thesis also takes an initial look at applying the method to different methods for parameterizing the pore size volumetric probability density function; first using a pore solid fractal (PSF) model known to be appropriate in natural porous media and then using a truncated power law (TPL) distribution for comparison.

Characterization of Porous Solids II Academic Press

The pore structure of foods directly affects the success of such food processes as drying, puffing, freeze-drying, and rehydration. Consequently, the pore structure of foods determines what types of food processes will work best with a particular food. This Brief will first discuss in depth the need to correctly measure the pore structure of foods and then will identify and describe in detail the current methods available to measure food porosity. Finally, it will review the applications of these various methods.

Annual Report Elsevier

The original properties of mesoporous molecular sieves are so unique that the design of most existing catalysts could be reconsidered. It might indeed be of interest to introduce MMS either as a support or as the active phase, merely on the basis of their high surface areas, narrow pore size distribution and flexibility in composition. The recent literature provides examples of MMS based catalysts of many types such as acid-base solids, supported metals and supported oxides, mixed oxides, anchored complexes and clusters, grafted organic functional groups and others. Examples of all these developments are documented in the present proceedings including some spectacular new proposals. The new metallic (Pt) mesophases are specially worth mentioning because they represent a new approach to producing non-supported highly dispersed metals. In these proceedings the reader will find feature articles and regular papers from many worldwide groups, covering all aspects of synthesis, physical characterization and catalytic reactivity of MMS and their chemically modified forms. It is actually remarkable that this recent development brought together an even broader spectrum of scientists from traditionally unrelated fields such as those of liquid crystals, surfactants, sol-gels, amorphous oxides and mixed oxides, solid state, adsorbents and heterogeneous catalysts. Obviously, this is a fast-growing research area which triggers the imagination and creativity at the cross-road between material design, molecular surface tailoring and catalytic applications.

Experimental Methods in Catalytic Research Elsevier

The growth of interest in newly developed porous materials has prompted the writing of this book for those who have the need to make meaningful measurements without the benefit of years of experience. One might consider this new book as the 4th edition of "Powder Surface Area and Porosity" (Lowell & Shields), but for this new edition we set out to incorporate recent developments in the understanding of fluids in many types of porous materials, not just powders. Based on this, we felt that it would be prudent to change the title to "Characterization of Porous Solids and Powders: Surface Area, Porosity and Density". This book gives a unique overview of principles associated with the characterization of solids with regard to their surface area, pore size, pore volume and density. It covers methods based on gas adsorption (both physi and chemisorption), mercury porosimetry and pycnometry. Not only are the theoretical and experimental basics of these techniques presented in detail but also, in light of the tremendous progress made in recent years in materials science and nanotechnology, the most recent developments are described. In particular, the application of classical theories and methods for pore size analysis are contrasted with the most advanced microscopic theories based on statistical mechanics (e.g. Density Functional Theory and Molecular Simulation). The characterization of heterogeneous catalysts is more prominent than in earlier editions; the sections on mercury porosimetry and particularly chemisorption have been updated and greatly expanded.

Abnormal Pressures While Drilling CRC Press

Small Angle X-Ray and Neutron Scattering with Applications to Geomaterials provides techniques for the analysis of geomaterials, which is of great significance for humans because geomaterials are related to earthquake, resource development, underground spaces, carbon dioxide storage, and more. The book introduces the fundamental theory of small angle X-ray and neutron scattering and covers pore accessibility characterization for natural rocks from four aspects, including quantitative evaluation of pore structure heterogeneity and anisotropy, quantification of pore modification in coals due to pulverization, estimation and modeling of coal pore accessibility, and nanoscale coal deformation and alteration of porosity and pore orientation under uniaxial compression. Finally, interactions between pore structures and fluid behaviors in geomaterials are introduced, along with the connections between small-angle scattering and other techniques (NMR cytophotometry, Transmission Electron Microscopy and synchrotron radiation SAXS and nano-CT) described. Covers both theory and applications of small angle X-ray and neutron scattering as related to geomaterials Provides context for using the techniques described in the book in connection with other well-known techniques Includes analysis methods of interactions between pore structures and fluid behaviors in geomaterials

Methods of Determination of Pore Structure Permeability and Diffusion Cambridge University Press

The book covers basic theory, progress and applications of sodium-ion batteries. It intoduces the reader to anode, cathode, electrolyte battery materials and properties. It also describes compatibility and stability of the whole battery system. It is a valuable resource for anyone interested in energy storage.

Characterisation of Porous Solids V ASTM International

Analysis of the filtration performance of a geotextile filter necessitates accurate information about the size distribution of geotextile pore openings. The effectiveness of the bubble point test in determining the pore and constriction sizes of geotextiles was evaluated. The characteristic woven geotextile pore and nonwoven geotextile constriction sizes, O95, were determined for a variety of specimens and compared with both the manufacturers' reported AOS values, and with those determined from the two previously developed image-based procedures and theoretical equations. The results indicated that the O95 sizes of woven mono and multifilament geotextiles determined by image analyses compared well with the AOS values, whereas the same observations were not made for the bubble point-based O95 sizes. The O95 constriction sizes of various nonwoven geotextiles obtained by the bubble point test were not comparable to the manufacturers' reported AOS values, indicating the limitation of ASTM D 4751 in determining constriction sizes. A direct method, such as image analysis, may be a better approach for determining the pore sizes of woven geotextiles, whereas the bubble point method should be preferred to determine constriction sizes in a nonwoven geotextile. Recommendations are made in regard to improvements in the current ASTM standard on bubble point testing.

Comparison of Methods for the Determination of the Pore System of a Potential German Gas Shale Springer Science & Business Media

This book Catalysis from Theory to Application. An Integrated Course encompasses the lectures of an integrated course on Catalysis (CIC2006) organized in the University of Coimbra according to the guidelines set up by the ERA-Net ACENET (Applied Catalysis European Network). The book is subdivided in five sections: heterogeneous, homogeneous, photo- and electro-catalysis and a fifth section covering experimental design and planning.The course and the lectures presented in this book intend to offer a broad and comprehensive survey on the different subjects of catalysis. Indeed, most graduate students in Chemistry or Chemical Engineering have only fragmented knowledge. Accordingly, the book is intended for undergraduate and post-graduate students or Industrial Researchers of Chemistry and Chemical Engineering interested in acquiring integrated knowledge in this field.

PF-curves Analysis, Quantimet and Sand Sieve Analysis Methods of Pore-size Distribution of Envelope Material Determination and Their Comparison Geological Society of London

The current book attempts to fill the gap in one of the major subject of land drainage that will have a major impact on production and productivity of irrigated lands. The book Titled `Drainage Engineering: Principles and Practices` deals with the subject of surface and subsurface drainage to reclaim waterlogged salt affected soils. Based on the course curricula as suggested by Deans´ committee constituted by ICAR, the current publication has been divided into 11 Chapters covering all the facets of land drainage as applied to agriculture. Each chapter covers one of the related issues beginning with general introduction to water logging, soil salinity and land drainage in Chapter 1.Surface drainage methods, an essential intervention in monsoon climatic regions and as supplement to the subsurface drainage are included in Chapter 2. Drainage investigations, a precursor to problem diagnosis and to assemble the drainage design parameters are included in Chapter 3. The drainage design procedures such as assessment of drainage depth, spacing and capacity of drains forms the subject matter of Chapter 4. While drainage materials are discussed in Chapter 5, drainage construction procedures and methodologies to monitor and evaluate completed projects are included in Chapter 6. Some of the new drainage techniques such as mole, interceptor, vertical and bio-drainage have been included in Chapter 7 since these can either be applied singly or in integration with horizontal subsurface drainage. Chapters 8-10 deal withreclamation of salt affected soils,acid soils and management of saline water. Eco-friendly reuse and disposal of saline drainage wateralso form the subject matter of discussion of Chapter 10. Cost calculations, socio-economic and environmental issues associated with drainage projects have been included in final chapter 11. Glossary of terms has been added for quick overview of the terms used in the book. Clearly, each and every aspect of surface and subsurface drainage for agricultural lands has been covered in the book.Besides covering the principles of land drainage, field practices have been included making the book a handy tool for specialized training programmes on land drainage. It is believed that the book will find its place in the shelves of students and teachers, field functionaries and libraries of state agricultural universitiesand civil engineering colleges.

Porosity and Pore Size Distribution of Materials. Method of Evaluation by Gas Adsorption CRC Press

Limestone is a highly successful and widely used building material, found in many important

historic buildings and new monuments around the world. Whilst its success reflects its durability under a wide range of environmental conditions, there are still important questions surrounding the selection, use and conservation of build-ing limestones. In order to make best use of new limestone today, and to conserve old limestone most effectively, we need to bring modern research methods to bear on understanding the characteris-tics of different limestones, what mortars to use, and how key lime-stones have responded to polluted atmospheres. This volume brings together recent inter-disciplinary research on these issues, illustrating the diversity of innovative techniques that are now be-ing applied to furthering our understanding of building limestones.

Characterization of Porous Solids and Powders: Surface Area, Pore Size and Density BoD – Books on Demand

Composites are made up of constituent materials with high engineering potential. This potential is wide as wide is the variation of materials and structure constructions when new updates are invented every day. Technological advances in composite field are included in the equipment surrounding us daily; our lives are becoming safer, hand in hand with economical and ecological advantages. This book collects original studies concerning composite materials, their properties and testing from various points of view. Chapters are divided into groups according to their main aim. Material properties are described in innovative way either for standard components as glass, epoxy, carbon, etc. or biomaterials and natural sources materials as ramie, bone, wood, etc. Manufacturing processes are represented by moulding methods; lamination process includes monitoring during process. Innovative testing procedures are described in electrochemistry, pulse velocity, fracture toughness in macro-micro mechanical behaviour and more.

Quantitative Characterization and Performance of Porous Implants for Hard Tissue Applications Elsevier

Membrane Characterization provides a valuable source of information on how membranes are characterized, an extremely limited field that is confined to only brief descriptions in various technical papers available online. For the first time, readers will be able to understand the importance of membrane characterization, the techniques required, and the fundamental theory behind them. This book focuses on characterization techniques that are normally used for membranes prepared from polymeric, ceramic, and composite materials. Features specific details on many membrane characterization techniques for various membrane materials of industrial and academic interest Contains examples of international best practice techniques for the evaluation of several membrane parameters, including pore size, charge, and fouling Discusses various membrane models more suitable to a specific application Provides examples of ab initio calculations for the design, optimization, and scale-up of processes based on characterization data

Advances in Composite Materials Scientific Publishers

Reprint of the original, first published in 1875.

Drainage Engineering: Principles and Practices Elsevier

The Fifth International Symposium on the Characterisation of Porous Solids (COPS-V) was held at Heidelberg, Germany, from May 30 to June 2, 1999. About 220 participants from 25 countries enjoyed a very successful meeting with 32 lectures and 155 poster presentations. The Symposium started with a highly stimulating lecture by Sir John Meurig Thomas, Cambridge, highlighting the recent developments in engineering of new catalysts. The following two full sessions were devoted to theory, modelling and simulation which provide the basis for the interpretation of pore structural data of adsorbents and finely dispersed solids. Sessions 2 and 3 focused on the advances in the synthesis and characterisation of highly ordered inorganic adsorbents and carbons. Sessions 4 and 5 addressed important questions with respect to the characterisation of porous solids by sorption measurement and other related techniques. The intensive three-day programme provided a stimulating forum for the exchange of novel research findings, concepts, techniques and materials which are collected in this volume.