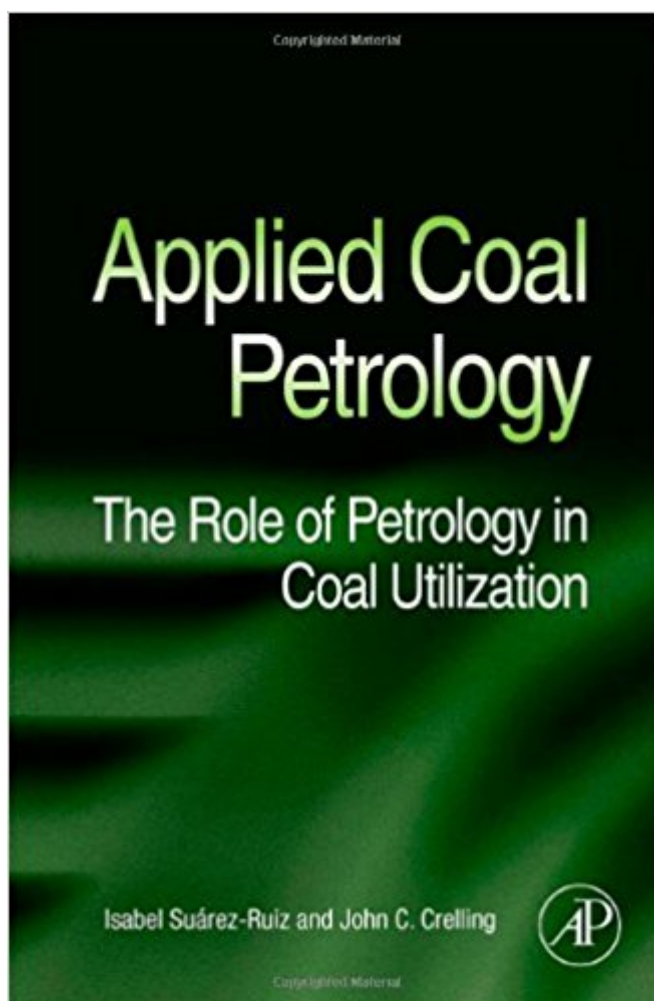


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Applied Coal Petrology: The Role Of Petrology In Coal Utilization



Synopsis

This book is an integrated approach towards the applications of coal (organic) petrology and discusses the role of this science in the field of coal and coal-related topics. Coal petrology needs to be seen as a continuum of organic (macerals) and inorganic (minerals and trace elements) contributions to the total coal structure, with the overprint of coal rank. All this influences the behavior of coal in utilization, the coal by-products, the properties of coal as a reservoir for methane or a sequestration site for carbon dioxide, and the relationships of coal utilization with health and environmental issues. The interaction of coal properties and coal utilization begins at the mine face. The breakage of the coal in mining influences its subsequent beneficiation. Beneficiation is fundamental to the proper combustion of coal and is vital to the preparation of the feedstock for the production of metallurgical coke. An understanding of basic coal properties is important for achieving reductions in trace element emissions and improving the efficiency of combustion and combined-cycle gasification. The production of methane from coal beds is related to the properties of the in situ coal. Similarly, coal bed sequestration of carbon dioxide produced from combustion is dependent on the reservoir properties. Environmental problems accompany coal on its way from the mine to the point of utilization and beyond. Health aspects related with coal mining and coal utilization are also included because, in planning for coal use, it is impossible to separate environmental and health issues from the discussion of coal utilization. The book is aimed at a wide audience, ranging from researchers, lecturers and students to professionals in industry and discusses issues (such as the environmental, and health) that are of concern to the general public as a whole. This book focuses on the applications of coal (organic) petrology to our modern society. It is an integrated approach to help the reader appreciate the importance of coal quality and coal utilization. Coal composition (macerals, mineral, trace elements) and the overprint of coal rank are treated together. The book synthesises all the possibilities of the organic petrology as a tool for coal utilization in conventional applications (mining and beneficiation, coal combustion, gasification, liquefaction, carbonization), as a precursor of carbon materials and as a petroleum source and reservoir rock. The role of applied petrology in the characterization of solid by-products from coal utilization is also discussed. In addition, this book describes the present status of environmental and health problems linked to coal utilization and the ways in which such problems might be overcome in the future.

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Customer Reviews

Isabel Suñer-Ruiz is a Tenured Scientist at the Instituto Nacional del Carbon (INCAR-CSIC, Spain) working in the field of applied Organic Petrology on coal and coal-by products. She received her PhD in 1988 from the University of Oviedo (Spain) for her Doctoral Thesis on oil shales and source rocks. She has spent extensive periods of time carrying out research in Petrology and Organic Geochemistry in well known laboratories in France (Orfans) and the US (SIU, Carbondale, and CAER, Lexington). Dr. Suñer-Ruiz has published extensively on topics of organic petrology related to fundamental and applied aspects of this science, recently receiving the 2006 Organic Petrology Award from the International Committee for Coal and Organic Petrology (ICCP).

John C. Crelling received his B.A. in Geology (University of Delaware) in 1964. At The Pennsylvania State University he received his M. S. degree in Geology in 1967 and his PhD in 1973. He started his professional career in 1972 at the Homer Research Laboratories of the Bethlehem Steel Corporation. In 1977 he became a Professor of Geology at Southern Illinois University and leader of the Coal Characterization Laboratory. At SIU he established a research program with the overall objective of improving the petrographic characterization of coal to better predict its behaviour and later he established a Maceral Separation Laboratory for the separation and characterization of pure coal macerals. He recently created an internet-based petrographic atlas of coals, cokes, chars, carbons, and graphites.

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