

# Journal of Sedimentary Research

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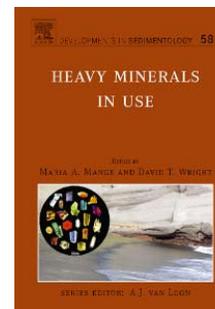
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***Heavy Minerals in Use***, edited by Maria A. Mange & David T. Wright, 2007. Developments in Sedimentology. Elsevier, P.O. Box 211, 1000 AE Amsterdam, The Netherlands. Hardback, xlv + 1283 pages. Price EUR 136.00; GBP 95.00; USD 165.00. ISBN 978-0-444-51753-1.



The use of heavy minerals is a long established approach in the study of clastic sediments. Advancements in analytical techniques in the last few decades, as well as an ever improving understanding of their behavior within the sedimentary cycle, have greatly broadened the scope of information which may be extracted from heavy-mineral grains. Frequently, heavy-mineral analysis takes on a leading role in studies dealing with provenance, basin analysis, tectonic and palaeogeographic reconstructions, sediment dynamics in both modern and past environments, soil development, etc., along with numerous applications in industry. With a well balanced combination of review papers from many of the most respected experts in the community and a large assortment of case studies, this book gives a thorough account of our present knowledge regarding heavy-mineral research, covering its principles, applications, and techniques.

The entire book contains a total of 46 individual contributions (labeled as chapters) which are organized into 4 main parts, each further divided into several sections.

Part I concentrates on the fundamental principles and processes which dictate the composition of heavy-mineral suits, as well as various analytical and statistical approaches to heavy-mineral analysis. The chapters included in this part of the book should be of particular interest to those new to the subject as they do a great job of covering both the strengths and potential pitfalls in heavy-mineral research. The first three sections each concentrate on an important factor which can influence a heavy-minerals suit: hydraulic sorting, chemical dissolution and grain size. With several informative review papers, section four gives a useful overview of the techniques used in investigating heavy minerals, including single-mineral geochemical analysis, application of the scanning electron microscope and high-resolution heavy-mineral analysis. Such techniques have become commonplace in today's research and appropriately receive their deserved attention in this book. Section five gives interesting examples of how applying statistical tools to heavy-mineral data sets can provide a more robust analysis than can be achieved by mere visual inspection of tabulated data and simple graphs.

Part II demonstrates the usefulness of heavy-mineral suits by introducing a wide range of case studies which successfully apply them in deciphering sediment provenance in an assortment of different environments and settings. The first section covers both modern and ancient examples coming from different parts of the globe, while section two concentrates on studies from active geodynamic settings.

Part III investigates both integrated and interdisciplinary applications of heavy minerals. The first section of part III reviews and demonstrates the strength of the heavy-mineral approach when a combination of analytical techniques is brought together to unravel a geological problem. The second section explores the use of heavy minerals in interdisciplinary research, namely forensics and geoarchaeology. Although lacking personal experience in these fields, I found this section highly interesting and thought it provoking, and I am sure other readers will as well.

Part IV demonstrates the usefulness of heavy minerals in industrial applications, where it has long been a well established method of investigation. Sections in this part deal with examples from the petroleum and placer-mining industry, as well as diamond exploration. This 58<sup>th</sup> volume of the book series “Developments in Sedimentology“ provides the most comprehensive look into the subject of heavy minerals in sedimentary studies to date. The book does a good job in reaffirming the importance of the “classical” investigative approach by light microscope as a crucial starting point for any heavy-mineral study, but at the same time gives due credit to advanced analytical techniques and how they can be combined. My only criticism might be that I would like to have seen more in the way of contributions to one or two of the sections. However, this observation might be somewhat subjective since the comprehensiveness of most of the sections does tend to spoil the reader. On the other hand, the only drawback of its whopping 1283 pages is perhaps that the size of the book becomes a bit cumbersome in everyday use. Luckily, in the case of „Heavy Minerals in Use“, this abundance of text does not dilute the overall quality of a book. The editors have done an excellent job of gathering an impressive collection of high-quality contributions relevant to the various aspects of heavy-mineral research. The individual contributions have been organized into appropriate sections, making it relatively easy to find a specific subject matter of interest. Additionally, the useful “Introduction“ and “Overview“ provided by the editors greatly helps in this regard. Both students and seasoned experts working with heavy minerals and clastic sediments in general will find this book an essential piece of literature. It is highly recommended for libraries of universities and research institutions.

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