

Evaporites, Petroleum and Mineral Resources. Dev. in Sedimentology, Vol. 50

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Review by Christopher G. Kendall

This excellent text which I really enjoyed which consists of six papers or chapters on both recent and ancient evaporites with the greatest of it's emphasis on the depositional and diagenetic setting of evaporites rather than their relationship to petroleum. This shouldn't put the reader with a strong interest in petroleum and evaporites off since while only one chapter deals with the petroleum potential of evaporites in any detail the extensive descriptive writing and well illustrated examples described throughout the book provide a fine introduction the problems of evaporites and their occurrence and does lead into their role in relationship with hydrocarbons. Never the less the title of the book is misleading, probably representing an intention of the editor which only partially came to fruition.

The book organized to begin with a concise and well illustrated paper by Robertson Handford. This describes marginal marine halite which discusses the controls on Halite precipitation, in situ growth and transport, crystallography, it's early diagenesis, and a variety of ancient and modern settings for this mineral. Settings include the Danakil depression of Afar, Lake MacLeod of Australia, and the Permian Basin of Texas.

It is followed by a paper by John Warren describing sulphate dominated sabkhas, salinas, mudflats and salterns, illustrated with a number of both recent and ancient examples ranging from the Holocene of the Arabian Gulf or the Corong of Australia to the Permian of West Texas or the Ferry Lake Anhydrite of East Texas.

Next is a paper by Smoot and Lowenstein on the depositional setting of Non-Marine evaporites. There are extensive descriptions of sediments from lacustrine, to saline pans, to mudflats, to delta, to alluvial fans, to ephemeral and perennial stream settings, aeolian sediments and springs. The authors consider both recent and ancient settings. The latter including the Green River Formation of the Western USA, the Tajo Basin of Spain, the Newark Basin of the USA, the Fundy Basin of Canada, and the Rotliegendes and Zechstein of the North Sea.

There is paper on petroleum and evaporites by Hite and Anders. This paper is probably the source of the "petroleum" in the title of the book. The paper deals with a number of examples of the production of organic matter in marine settings, and lacustrine settings. It considers evaporites as source rocks, discusses evaporite oils, the role of evaporites in preserving organic matter, the suppression of the reflectance of vitrinite by evaporites, and evaporites and reservoirs. This paper's commonest illustration is the gas chromatograms.

Next is a paper by Kyle and Posey which deal with the development of cap rocks associated with salt domes. Examples cited include cap rocks of the Gulf of Mexico, Iran and North Africa. Topics covered include fluid infiltration, sediment loading, timing and causes of diapirism and it's relationship to cap rock development, etc. The paper considers sulphur deposits and other mineral deposits associated with cap rocks and diapirism. It does not enter into any extensive discussion petroleum entrapment and cap rocks.

The final paper of the text is on the role of evaporites as associated with mineral resources.

This text by Kyle emphasizes metallic along with a consideration of iodine, bromine, and nitrogen. It discusses topics like superior-type Iron formations, and evaporites and igneous hosted ore deposits.

I enjoyed reading this book and think it will be of help to the general reader, including graduate students and professional geologists who are interested in evaporites to the specialist who needs to track down the latest news on the evaporite research. I am pleased to have the text on my shelves and recommend this book to you in you want to know more about this fascinating topic.