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Genesis and evolution of lower Cambrian Longwang-miao formation reservoirs, Sichuan Basin, Southwest China

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In recent years, the largest integral single gas field of the lower Cambrian Longwang-miao formation with proved reserves of $4403 \times 10^8 \text{ m}^3$ was found in Sichuan Basin, China and the main production is from Longwang-miao formation grain dolomite. Based on observation of outcrops, cores and thin sections and analysis of logging data and experiment, the features, main controlling factors, evolution and distribution of the Longwang-miao formation reservoirs in the lower Cambrian, Sichuan Basin are examined carefully and the distribution of favorable reservoirs is predicted. The Longwang-miao formation reservoirs are grain shoal-dolostone fracture-vug type made up of residual dolarenite, oolitic dolomite and crystal dolomite with vugs and dissolution pores as the main storage space, residual inter-granular pores, inter-crystalline pores and fractures as the secondary storage space, these reservoirs have a porosity of 2% to ~8%, 4.28% on average and a thickness of 20m to ~60 m, 36 m on average. Shoal facies and penecontemporaneous dissolution are the main factors controlling the reservoir occurrence. Grain shoal, the basis of reservoir development controls the phases and distribution of reservoir. Penecontemporaneous dissolution is the key factor affecting the formation of the main reservoir space. In addition, penecontemporaneous dolomitization plays a constructive role in the preservation of the pores formed earlier and generation of micro-fractures in late stage. The reservoirs experienced four evolution stages. The sedimentation and penecontemporaneous dissolution in pore-forming period laid the material basis for reservoir space types and physical property conditions. Supergene karstification and burial dissolution made some contributions to the improvement of reservoir physical properties. Hydrothermal mineral filling and asphalt filling are the main factors making reservoir quality worse. Based on the main controlling factors of the Longwang-miao reservoir, the favorable reservoir zones are ancient high topography areas between Huayingshan Fault and Longquanshan Fault and breakthroughs are expected to make in the Guangan-Nanchong-Jiange area.

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A study on reusing highly saline concentrate water produced from electro dialysis system

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Desalination is becoming a solution for water scarcity in most arid countries where structural water shortage is a permanent phenomenon. One of the applicable methods in desalination is electro dialysis. Electro dialysis involves the transfer of ions from a low salinity stream to a higher salinity stream from diluate to concentrate. In an electro dialysis stack, the dilute (D) feed stream, brine or concentrate (C) stream and electrode (E) stream are allowed to flow through the appropriate cell compartments formed by ion exchange membranes. The aim of this work was to concentrate the highly saline concentrate stream produced from the electro dialysis to extract salts from it instead of pouring it to the sea and save the aquatic life from it.

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