Quantifying Some Aspects of Salt Diapirism by Experimental Modelling

H. A. Koyi

Hans Ramberg Tectonic Laboratory, Uppsala University, Uppsala, Sweden Exotic blocks of non-evaporitic rocks are found in many Hormuz salt diapirs and deformed segmented of anhydrite and dolomite are mapped within Zechstein salt diapirs. These blocks are interpreted to being brought up passively by salt diapirs. Analogue models are used to study the mechanism responsible for the entrainment of these blocks. Model results suggest that these blocks could be detached parts of layers initially embedded within the salt layer before initiation of the diapirs. The presence of interlayered denser anhydrite and non-evaporitic sediments (volcanics) in many salt diapirs in Germany and Iran supports this interpretation.

During diapir initiation, due to the viscous flow of the diapiric material, these interbedded layers are extended, boudinaged, and rotated to a steep position in the stems of the diapirs where they are entrained upward by the rising salt. Presence of denser blocks in salt diapirs indicates that the rate of diapiric rise has been higher than the descend rate of the block. However, model results show that when salt supply decreases the descend rate of the blocks outpaces the rate of diapiric rise. Consequently, the denser blocks, which were taken up through the stem of the diapir, start sinking within the diapirs. During their descend, the blocks undergo intense folding. The descend rate of the blocks vary depending on the size of the blocks. Large upright blocks descend relatively faster the smaller blocks.