

A Physico-Chemical Characterisation of the Biogenic Silica Diagenesis Transition Zones

Raluca Cristina Neagu

3-D Lab, School of Earth and Ocean Sciences, Cardiff University, United Kingdom,

E-mail: neagurc@cf.ac.uk

The silica diagenesis transition zones have been recognised and analysed from core samples to outcrop and seismic data, with the purpose of evaluating the impact of diagenesis on the evolution of sediment physical properties during burial and deformation. In general, the opal-A to opal-CT transition zones are narrow depth intervals, about 20 to 30 m thick, according to Ocean Drilling Program data. Over these narrow zones, important changes in the physical properties of the sediments and interstitial water chemistry take place. Lithological, physical and chemical data were extracted from the reports of a number of sites which have drilled the silica diagenetic transitions. The results were compared with outcrop data from the Monterey Formation in California. The main aims of this study are to define and characterise the opal-A to opal-CT transition zones from a physico-chemical point of view. Establishing what a transition zone represents is imperative because the physico-chemical characterisation of the sediments undergoing silica diagenesis depends on how the transition zone is defined. This characterisation will provide the criteria that could be used to infer the presence of a silica diagenesis front where only limited data are available. The role of diagenesis on the evolution of sediment physical properties is not very well understood, so the results of this study will help in seismic interpretation of silica diagenesis in areas with poor well control.