Pore Fluid Chemistry of Sediments from Krishna-godavari Basin: Controls on Sulfate Profile

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Recently large number of long cores (25-50 m) were collected on board *Marian Dufresne* (MD-161: May, 2007) using a Giant Callypso piston corer over a water depth range of 650-1600 m from K-G Basin as part of our gas hydrate exploration program. The study areas lie within the continental slope region. Core locations were selected based on sub-bottom profiler (SBP) data. Sulfate and C1-C3 hydrocarbon, chloride concentrations, total alkalinity, and carbon stable isotope raios of CH₄ and CO₂ have been measured in several cores. The depth of sulfate-methane interface (SMI) from the sediment surface varies from 5 to19m. Three sulfate concentration profiles have been recorded, viz., concave up with with high gradient, sigmoidal and kink types. δ^{13} C of CH₄ (as low as -110‰) and C1/C2+C3 ratios (as high as 4193) below the SMI are typical for biogenic hydrocarbon gases. The SMI is a zone of intense methane oxidation mediated by anaerobic methane oxidizing archaea. An attempt has been made to understand the estimate flux and it's effect on sulfate profile and depth of sulfate methane interface.