



Anaerobic oxidation of methane in coastal sediments off Qiao Island, Pearl River Estuary, China

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Anaerobic Oxidation of Methane (AOM) is one of the most important way to consume CH_4 in marine sediments. Based on the measurement of methane, sulfate, ΣCO_2 and $\Sigma\text{CO}_2\text{-}\delta^{13}\text{C}$ in pore water samples along three sediment cores (48-57cm in length) sampled by multicorer, AOM in coastal area off Qiao island, Pearl River Estuary, China is investigated. Sulfate concentration of pore water decrease with depth, meanwhile methane contents increase sharply in the base of sulfate reduction zone. ΣCO_2 increases with depth. $\Sigma\text{CO}_2\text{-}\delta^{13}\text{C}$ reaches maximum negative in sulfate-methane transitional zone. By means of diffuse flux of methane and sulfate in those three stations, it is estimated that contribution of AOM to the consumption of total sulfate is 10.5%, 25.9% and 15.4%, respectively. Correspondingly, ΣCO_2 produced by AOM is 5.5%, 13.7% and 8.3% of ΣCO_2 , respectively. AOM has significant contribution to the C and S cycling in the sediments with high content of organic carbon and frequently low level of oxygen in the area.