

X-ray fluorescence analysis of Japan Sea sediments around gas chimney structures

*Takaya Shimono¹, Ryo Matsumoto¹

1. Gas Hydrate Research Laboratory, Meiji University

We conducted X-ray fluorescence analysis of marine core sediments to clarify the geochemical relationship for the paleoceanographic and paleoclimate changes in offshore Joetsu (Torigakubi spur and Umitaka spur), the eastern margin of Japan Sea. Moreover, we investigate the presence and/or past methane discharges within sediments. We analyzed 104 sediment samples using four piston cores (PC1704, PC1706, PC1709 and PC1713). The cores were taken from gas chimney mound (PC1704, PC1706) and pockmark site (PC1709, P1713), offshore Joetsu, during the 1K17 cruise in 2017. X-ray fluorescence analysis of sediments at core PC1706 and PC1709 show barium fronts are developed above the sulfate/methane transition (SMT) due to precipitation of BaSO_4 , which is controlled by the upward flux of Ba^{2+} from sulfate depleted to sulfate enriched zone across the SMT. A barium front has conventionally been interpreted as an indicator of paleo-SMT zone (e.g. Dickens et al., 2001; Riedinger et al., 2006; Glen et al., 2007).

Keywords: Shallow gas hydrates, Gas chimney structures, Marine sediments, X-ray fluorescence analysis, Barium front