

EGU24-5780, updated on 12 Mar 2024

<https://doi.org/10.5194/egusphere-egu24-5780>

EGU General Assembly 2024

© Author(s) 2024. This work is distributed under the Creative Commons Attribution 4.0 License.



Rock magnetic anomaly caused by the pyritization linking to the gas hydrate dissociation off SW Taiwan

Yin-Sheng Huang¹, Chorng-Shern Horng², Chih-Chieh Su³, Shu-Kun Hsu⁴, Wen-Bin Doo¹, and Jing-Yi Lin⁴

¹Center for Environmental Studies, National Central University, Taoyuan, Taiwan (yinson@gmail.com)

²Institute of Earth Sciences, Academia Sinica, Taipei, Taiwan

³Institute of Oceanography, National Taiwan University, Taipei, Taiwan

⁴Department of Earth Sciences, National Central University, Taoyuan, Taiwan

In the study, we present the rock magnetic property from three sediment cores collected by the *R/V Marion Dufresne* (MD) during the cruise MD214 off SW Taiwan, and two of these cores, MD18-3542 and MS18-3543, have collected shallow hydrate samples. Core site MD18-3542 is on the South Yuan-An East Ridge, where an unconformity covered by fine-silt sediments lies at ~5.5 m below the seafloor, and the core site MD18-3543 is close to the Good-Weather Ridge with a gas-related pockmark and authigenic carbonates near shallow strata. The other core MD18-3548 was obtained at a basin with relatively stable deposition settings to get the background information. Rock magnetic measurements, including magnetic susceptibility (MS) and hysteresis parameters, are used to describe the downcore variations of the magnetic features, while the Day Plot and XRD analysis are applied to classify and identify the dominance of core magnetic components. Both cores MD18-3542 and MD18-3543 show the attractive anomaly with dramatic value-drop in the records of MS and hysteresis parameters, and the feature looks absent in the core MD18-3548. Such signature may link to the pyritization caused by the gas hydrate dissociation. The dissociated methane with hydrogen sulfide trapped under the structures (an unconformity at site MD18-3542 and authigenic carbonates at site MD18-3543) would form an anoxic setting and activate the pyritization at shallow layers. Detrital magnetite would be gradually turned into authigenic iron sulfides, and thus could cause the attractive anomaly in the MS and hysteresis records.