

## Characterization of Carboniferous sulfate mineral deposits in central Thailand

\*Junichiro Kuroda<sup>1,2</sup>, Hidetoshi Hara<sup>3</sup>, Katsumi Ueno<sup>4</sup>, Thasinee Charoentitirat<sup>5</sup>, Teruyuki Maruoka<sup>6</sup>, Takashi Miyazaki<sup>2</sup>, Akira Miyahigashi<sup>4</sup>, Stefano Lugli<sup>7</sup>

1. Atmosphere and Ocean Research Institute, the University of Tokyo, 2. Japan Agency for Marine-Earth Science and Technology (JAMSTEC), 3. Geological Survey of Japan, National Institute of Advanced Industrial Science and Technology (AIST), 4. Department of Earth System Science, Faculty of Science, Fukuoka University, 5. Department of Geology, Faculty of Science, Chulalongkorn University, 6. Graduate School of Life and Environmental Sciences, University of Tsukuba, 7. Dipartimento di Scienze Ghimiche e Geologiche, Università degli Studi di Modena e Reggio Emilia

We present petrographic and geochemical data of sulfate mineral deposits in northeast Nakhon Sawan, central Thailand, and provide new constraints on their age and depositional environments. The deposits are made up of a layered anhydrite in the lower part, and strongly deformed nodular and massive gypsum in the upper part. They are intruded by andesitic dikes that contain Middle Triassic zircons (ca 240 Ma). These dikes are probably part of the regional magmatic activity of the Sukhothai Arc during the Early to Middle Triassic. Sulfur ( $\delta^{34}\text{S}$ ) and strontium ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) isotopic compositions of the sulfates range from 15.86‰ to 16.26‰ and from 0.70810 to 0.70817, respectively. Comparisons with the Phanerozoic seawater isotopic evolution curve indicate that those values are best explained by precipitation from seawater during the Serpukhovian (ca 326 Ma) in the Late Mississippian epoch of the Carboniferous period (Kuroda *et al.*, 2017). This is consistent with previous studies of calcareous fossils in the limestones that crop out around this site (Ueno and Charoentitirat, 2011). Our interpretation is that evaporitic gypsum was originally precipitated from hypersaline seawater on a shallow lagoon or shelf on the Khao Khwang Platform during the Serpukhovian, and that this gypsum changed to anhydrite during early burial. The anhydrite was then cut by andesitic dikes during the Middle Triassic, and more recently the upper part of which was rehydrated during exhumation to form secondary gypsum near the surface. In the presentation we will also discuss the relationship of this sulfate mineral deposits with that in the northeastern Thailand (Surakotra *et al.*, 2017).

Kuroda, J., Hara, H., Ueno, K. et al. (2017) Characterization of sulfate mineral deposits in central Thailand. Island Arc, in press. doi: 10.1111/iar.12175.

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