Dr. Cahyo Aji Hapsoro, M.Si.
Department of Physics, Faculty of Mathematics and Natural Sciences,
Universitas Negeri Malang
Jl. Semarang No. 5, Malang, 65145, Indonesia
+62 852-9047-1437
cahyo.ajihapsoro.fmipa@um.ac.id

Prof. Dr. Ahmad Taufiq, M.Si.
Editor in Chief of JPSE (Journal of Physical Science and Engineering)
Department of Physics, Faculty of Mathematics and Natural Sciences,
Universitas Negeri Malang
Indonesia

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Dear Prof. Dr. Ahmad Taufiq, M.Si.

I am pleased to submit an original research article entitled **"Identification of Sediment Formation Based on Magnetic Content and Element Composition of Mud Volcano in Sangiran Sediment using VSM and X-Ray Fluorescence"** by consideration for publication in the JPSE (Journal of Physical Science and Engineering). This manuscript focused on geophysical and geochemical studies of rare earth elements (REE) in Sangiran Mud Volcano, Indonesia.

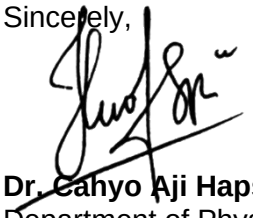
In this manuscript, we conducted on the magnetic content and the composition of the major oxide compounds in the Sangilan sediments. Sample analysis was based on two main methods: petromagnetic analysis and geochemical analysis. Petromagnetic magnetic analysis consists of frequency dependent magnetic susceptibility and VSM analysis. Meanwhile, geochemical analyzes using XRF analysis have been completed and various elemental grades have been determined. VSM results confirm that the magnetic content of Sangiran sediments is dominated by Fe contained in hematite (Fe2O3). At the same time, the Sangilan sediment samples were enriched by silicon (Si), iron (Fe), aluminum (Al), calcium (Ca), chloride (Cl), titanium (Ti), and potassium (K) according to XRF measurements. The samples exhibited the highest Si and Fe concentrations in samples T1 (Si = 29.48% and Fe = 13.66%) and T7 (Si = 24.95% and Fe = 12.01%). Meanwhile, in the T4 sample, the highest concentrations were Si and Ca, 23.45% and 13.45%, respectively. Retrieved from the value of magnetic susceptibility, the results of this study confirm that Fe content is one of the components of volcanic ash in the Sangiran sediment.

We believe that this manuscript is appropriate for publication by the JPSE (Journal of Physical Science and Engineering) because the exploration of REE on various mud volcanoes in the Sangiran area, Central Java, Indonesia is not only based on geochemical properties but also petromagnetic properties. This study will help develop mineral prospecting to study the abundance of REE in the Sangiran deposit and other sediments.

This manuscript has not been published and is not under consideration for publication elsewhere.

Thank you for your consideration.

Sincerely,



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