

## ABSTRACT

Recently, the potential of volcanoclastic reservoir has been suggested and interesting for exploration. Kebo-Butak and Semilir Formations are situated in the Southern Mountain, Central Java, Indonesia, where is known as an area that affected and formed by thick sequence of Tertiary volcanic sediment and sedimentary rocks from Oligocene to Miocene. The volcanic sandstone and resedimented volcanoclastic are highly effected by volcanic material as tuff to its properties as reservoir rocks at this both formation, that why this current research is conducted in this area.

The aims of the research are to understand the reservoir properties of primary and resedimented volcanoclastic sandstone and correlate the petrological and petrophysical characteristics of both sandstones. In other to accomplish these objectives, field work observation and laboratory analysis including stratigraphic measurement, petrographic observation, petrophysic, SEM, and XRD analyses were carried out carefully for this research.

As the results, the good reservoir of primary volcanoclastic sandstone has the properties of porosity ranging from 21% to 33% and the permeability ranging from 264mD to 288mD. The good reservoir rock of resedimented volcanoclastic has the porosity values ranging from 32% to 34% and the permeability values ranging from 64mD to 891mD. Some rock samples that cannot act as good reservoir at Southern Mountain because have low capacity to store and transmit fluid by volcanic material as tuff and other volcanic glass and clay minerals as smectite, pyrophyllite and halloysite. The volcanic sandstone are mostly has angular grain shape and poor sorting which affected to the porosity and permeability too. Based on this case, The primary volcanoclastic has properties as reservoir rock than resedimented sandstone.

**Keyword:** Volcanic sourced materials, reservoir properties of sandstone, Southern Mountain.