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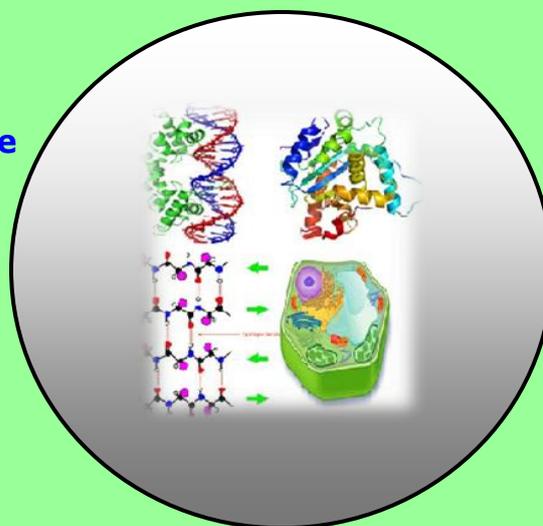
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## **Analysis of Mineral Characteristics in the Latuhalat Coastal Areas of Ambon Based on the Ftir Method**

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**ABSTRACT**

*The Latuhalat coastal area is the headland area of Ambon. This area is very important to know about the potential of geological disasters in the area. The potential of geological disasters can be know by analysing the mineral characteristics based on the FTIR method. Analysis results of the three type of rock samples by the spectrum produced in accordance with peaks formed by a functions group. M1 samples with wave number between  $3565\text{ cm}^{-1}$ - $3595\text{ cm}^{-1}$  which is formed by O-H functional groups that can identify that the types of minerals are kaolinite and amphibole. M2 samples with wave number between  $1500\text{ cm}^{-1}$ - $1570\text{ cm}^{-1}$  which is formed by the C=C functional groups, that can identify that the type of mineral is quartz. M3 samples with  $1700\text{ cm}^{-1}$  which is formed by the C=O functional group, that can identify that the type of mineral is calcite. So it cans interpretation that the types of rock in the Latuhalat coastal area are granite, pumice and limestone. Based on the type of rock such as granite, pumice and limestone in the area of research, it can be interpreted that in the Latuhalat coastal areas ever occurred geological disasters. Geological disasters that can occur in the area are the storm surge and flood tides. Where at the beginning of pumice and limestone that comes from the swept sea by a storm surge to the coastal area.*

**Keywords:** FTIR Method, Wave Number, Functions Group, Mineral and Geological Disasters.

**INTRODUCTION**

The Latuhalat coastal area ever occurred geological disasters such as storm surges and flood tides. Where, in the beginning of rock that comes from the sea floor and snagged a storm surge swept seashores Latuhalat. It is suspected based on the analysis of several samples of

the dominant rock types found in the Latuhalat coastal such as granite, pumice, and limestone.

Basically this research was conducted by analyzing rock samples taken from the Latuhalat coastal using FTIR method for identifying the type of mineral or rock types in the area. So it can be presumed post or potential geological disaster such as storm surges and flood tides in the Latuhalat coastal areas of Ambon.

### **Previous Study**

Geomorphology form Ambon Island is a unit of hills stretching from the Northeast to the Southwestern occupy about 70% of the area of this region with a relatively steep slope. Moreover, Ambon island geomorphology of the mountains to directly reach the beach. All the rivers flow from the mountains and empties into the coastal plain. Especially for the Latuhalat, form of beach geomorphology is a narrow strip of land and extends along the coast (Setyawan et.al, 2008).

From the geological aspects, based Geological map sheet Ambon Island in 1980 from the Centre for Geological Research (P3G) Bandung and some information (Tjokrosapoetro et. Al, 1993), the geological structure of the Latuhalat area consists of limestone coral and granite Ambon arranged in formation Manusela. Coral limestone is a type of sedimentary rocks with marine depositional environment inside. While granite Ambon is a type of igneous rock in (intrusive), also from the sea (Skinner and Porter, 1992).

The Latuhalat coastal area is the headland area of Ambon. This area is very important to know about the potential of geological disasters in the area. Geological disasters that can occur in the area are the storm surge and flood tide (Cappenberg, 1992). Where, initially limestone and granite Ambon derived from seabed dragged storm surge or tidal flooding along the coast and snagged Latuhalat.

## **MATERIAL AND METHODS**

Rock samples taken from Latuhalat coastal areas then analyzed using by FTIR method. Spectrum of rock sample analysis results can illustrate the functional groups present in the rock sample. Furthermore, the functional group is used to identify and distinguish various kinds of minerals alteration contained in rock samples, so it can be presumed about types of origin rock (Derrick et al, 1999). By knowing the type of rock found in Latuhalat coastal areas, it can be presumed post or potential geological disasters occurred in the area.

## **RESULTS AND DISCUSSION**

The content of mineral elements in rock samples taken from Latuhalat coastal areas of Ambon was analyzed using by FTIR method. Analysis results of the three type of rock samples in the form of the spectrum produced in accordance with peaks formed by a functional group are presented in Figures 1, 2, and 3 below:

M1 samples with wave number between  $3565\text{ cm}^{-1}$ - $3595\text{ cm}^{-1}$  which is formed by O-H functional groups that can identify that the types of minerals are kaolinite and amphibole. M2 samples with wave number between  $1500\text{ cm}^{-1}$ - $1570\text{ cm}^{-1}$  which is formed by the C=C functional groups, that can identify that the type of mineral is quartz. M3 samples with  $1700\text{ cm}^{-1}$  which is formed by the C=O functional group, that can identify that the type of mineral is calcite.

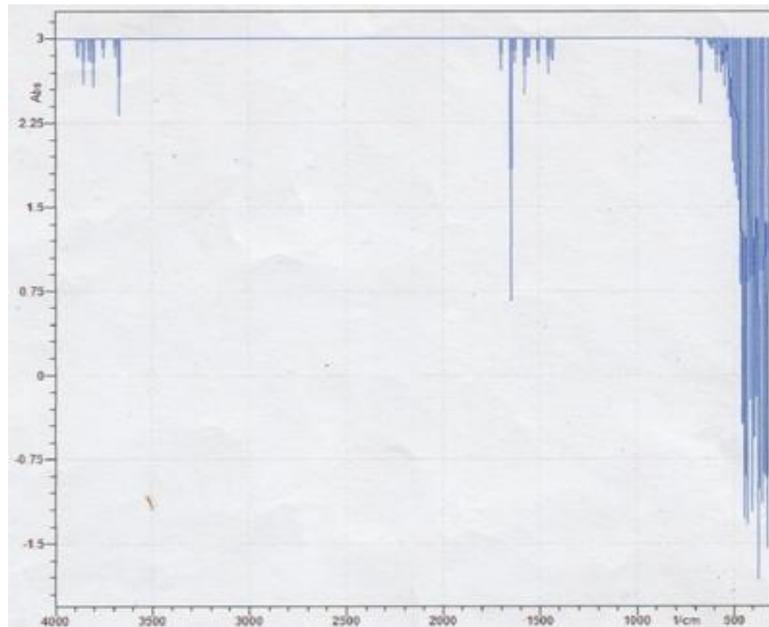


Figure 1. Results M1 samples with FTIR analysis

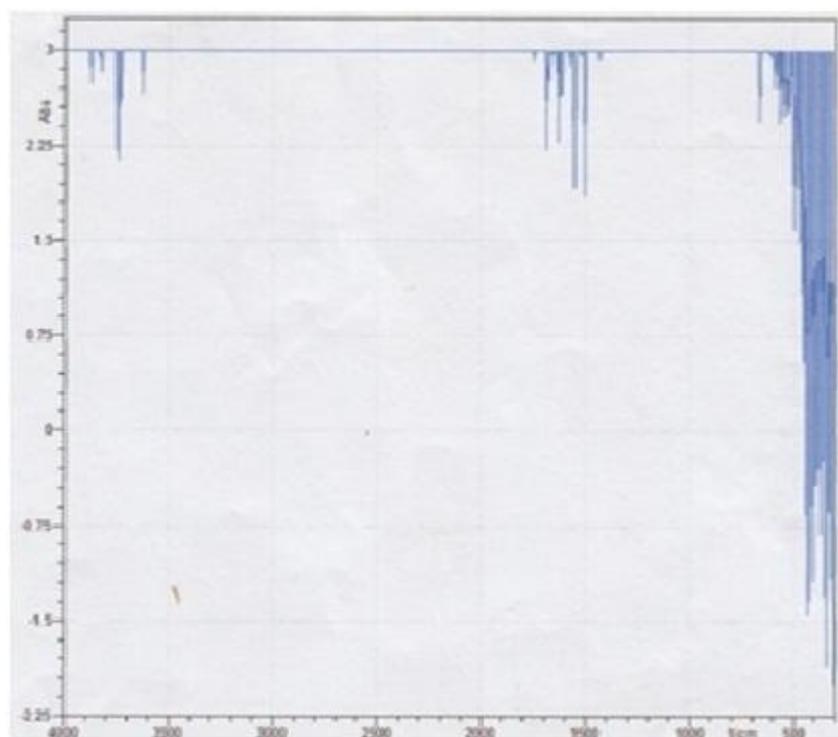
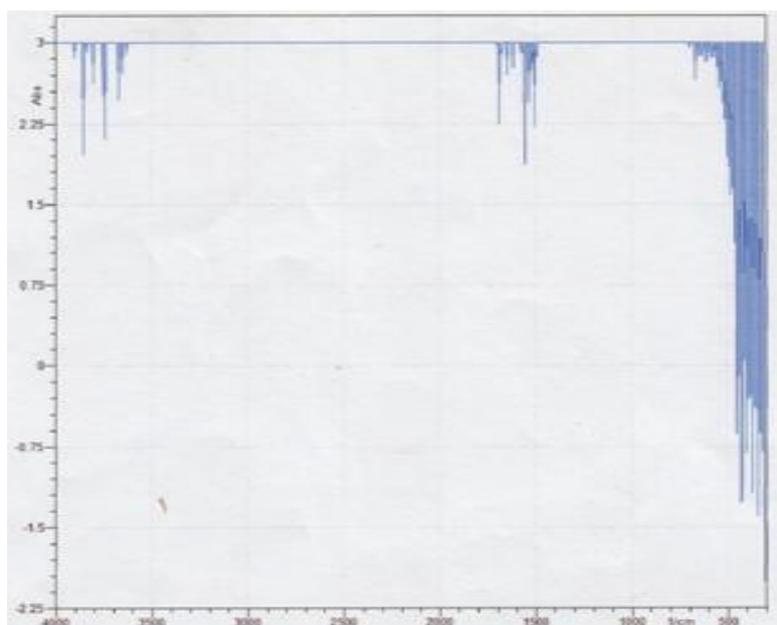


Figure 2. Results M2 samples with FTIR analysis



**Figure 3. Results M3 samples with FTIR analysis.**

So it can interpretation that the type of rock in the Latuhalat coastal area are granite, pumice and limestone. Indicate that there has been alteration of rocks around the coast Latuhalat. So it can be thought to the type of rock in the area is granite, pumice and limestone. Granite is an igneous rock in a while pumice and limestone is a type of sedimentary rock are all derived from the marine environment. However, this time the rocks have been spread evenly along the Latuhalat coastal.

## **CONCLUSIONS**

Based on the analysis of rock samples with FTIR method, it can be identified types of mineral alteration that appears in the Latuhalat coastal include: kaolinite, amphibol, quartz , and calcite . So it can be thought to the type of rock in the area is granite, pumice and limestone . The rocks are spread evenly along the Latuhalat coast. Based on the type of rock such as granite, pumice and limestone in the area of research, it can be interpreted that in the Latuhalat coastal areas ever occurred geological disasters. Geological disasters that can occur in the area are the storm surge and flood tides. Where at the beginning of pumice and limestone that comes from the swept sea by a storm surge to the coastal area.

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## **REFERENCES**

**Brian, J. Skinner and Stephen C. Porter 1992.** The Dynamic Earth, an introduction to physical geology2 edition, John Wiley and Sons, Inc. (Book).

**Derrick, M, R., Stulik, D. and Landry, J.M., 1999.** Infrared Spektroskopy in Conservation Science. Los Angeles: The Getty conservation Institute. (Book)

**Setyawan, W.B., Wijaya, B. and Guntoro, A., 2008.** *Prosiding IAGI 29th Annual Convention*. Vol. 4, Bandung 21-22 November 2008, 33-45 (2008); ISBN 979-96140-2-3 (Vol 1-4). (Conference Proceedings)

**Tjokrosoetro, S., E. Rusmana Dan Suharsono, 1993.** Laporan Geologi Lembar Ambon, Maluku, PPPG, Bandung. 32 h + peta geologi skala 1:250.000. (Book)

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