

## U-Pb dating of zircons and measurement of organic carbon isotope in the sedimentary rocks from the BGB

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The Swaziland Supergroup comprises three Groups; a lower, the Onverwacht Group; a middle, the Fig Tree Group; and upper, the Moodies Group. The target of this study is the Fig Tree Group which comprises interstratified terrigenous clastic units and dacitic to rhyodacitic volcanic rocks. These strata seem to have two formation-level units; the Mapepe and Auber Villiers Formations. The Mapepe formation includes about 700m of shale, chert-grit sandstone, and chert-clast conglomerate interstratified with fine-grained felsic pyroclastic and volcanoclastic rocks. It is thought that deposition took place in alluvial, fan-delta, and shallow to moderately deep subaqueous environments. This work has conducted the stratigraphy of the Mapepe formation by making detailed column, measuring magnetic susceptibility, dating U-Pb abundance ratio of zircons, and dating stable carbon isotope ratios of organic carbon in the sedimentary rocks from the study area. The purpose of this study is to estimate a sedimentation environment of the Mapepe formation through the use of diverse ways.

U-Pb dating of zircon is the most prevailing method of determining the depositional ages from the sedimentary rocks of Archean-Proterozoic in which the biostratigraphy has not been established. We collected 7 redsandstone samples from the Mapepe Formation and 5 intrusive ones from the Onverwacht Group, and were able to obtain zircon from only 1 sample each. U-Pb measurements of Zircons were conducted by LA-ICP-MS installed at the National Science Museum.

We measured two zircons; from the Mapepe Formation redsandstone and the Onverwacht Group intrusive rock. Zircons from the Mapepe Formation has 29 concordant ages and a peak in age about  $2954 \pm 9\text{Ma} \sim 3546 \pm 13\text{Ma}$ . There are more than a few zircons younger than this age, and it is considered that there are two possibilities; the zircons reflect the depositional age of the area, and a possibility of Pb defect. In any case, these data are in contradiction with the previous research (Lowe D. R. et al., 1999), so that has quite a bit of room for improvement such as increasing the number of measured zircons to discuss statistically. Zircons from the Onverwacht Group has 6 concordant ages and indicates  $3270 \pm 14\text{Ma}$ . This data is consistent with the previous research (Lowe D. R. et al., 1999)

Green shale from the Mapepe formation showed at an average of 0.72wt% of amount of organic carbon. Black shale, green shale, and jasper from the Mapepe formation showed between -30.6~-20.3 ‰, which suggests a kind of possibility of biological activities.

Keywords: U-Pb Dating of Zircons, Measurement of Organic Carbon Isotope, Barberton Greenstone Belt