Japan Geoscience Union Meeting 2011
(May 22-27 2011 at Makuhari, Chiba, Japan)

BPT022-P04 Room:Convention Hall Time:May 25 10:30-13:00

Detail stratigraphic description of Komati section at 3.2Ga in the Mapepe Formation in the Fig Tree Group of the Barbert

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The Mapepe Formation is the lowermost part of the Fig Tree Group in the Barberton Greenstone belt, and its sedimentary age of single zircon U-Pb datings is 3260 to 3230 Ma (Kroner et al. 1991). Our study area (Komati section) is located along the Komati River near the border to Swaziland. This section preserved more than 300m-long continuous outcrop and consists of well-stratified sedimentary sequence with bedded chert and shale. We performed 1/100 scale geologic mapping to identify stratigraphic continuity. The Komati section is divided into 6 blocks (B1-, B2-, C-, D1-, D2- and E-block) bounded by the deformed zones. Thickness of each blocks is 6.8m, 45m, 22.8m, 19m, 5.7m and 23m, respectively. Total thickness of the studied section reaches 128m.

Lithology: The studied section may be divided into the following four rock types. 1) white chert (massive); 2) red chert: It consists of laminated, red-colored bedded chert and white-red chert that changes its color from white to red with sharp boundary and partly with boudinage structure. 3) black shale (massive); 4) red-brown (Fe-rich) shale. In each block, the red-brown shale amounts to 60%, white chert 20%, and red chert and black shale 10%. Red chert is increasing and red-brown shale is decreasing to the top at each block.

Magnetic susceptibility (k) is measure of the degree of mineralization for a material in response to applied magnetic field. In this study, we measured magnetic susceptibility at two ways. 1) Vertical sections: To understand stratigraphic variation, we measured two times of the whole stratigraphic vertical section (total 128m thick) at 3cm intervals. 2) Horizontal sections: To understand horizontal variation in each bed, we measured 4m along in each bed, and totally 83 beds from all blocks. Magnetic susceptibility is increasing to the top in each block. Based on the horizontal variations of magnetic susceptibility, we divide the section into 4 groups; A-group: Low k value ($0.1*10^{text}$ SI~$1.0*10^{text}$ SI). It consists of black shale, red-brown shale and white chert. B-group: Medium k value (1.0~$5.0*10^{text}$~$70*10^{text}$ SI). It consists of red chert and white-red chert. C-group: High k value (1.0~$5.0*10^{text}$ SI~70~$420*10^{text}$ SI). It consists of boudinage red chert. Boudinage part has high k value. D-group: Very high k value (15~$30*10^{text}$ SI~70~$420*10^{text}$ SI). It consists of red chert with iron bed. These groups represent different contents of Fe-bearing magnetic minerals.

Keywords: Archean, Barberton Greenstone Belt, Mapepe Formation, Magnetic susceptibility