

## MINERAL CHEMISTRY AND THERMOBAROMETRY OF THE MAFIC IGNEOUS ROCKS OF YAMNE VALLEY, ARUNACHAL PRADESH, INDIA

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### Abstract

The Yamne Valley is a part of the Eastern Himalayan syntaxial band and is located in East Siang district of Arunachal Pradesh. The mafic igneous rocks exposed along Pasighat-Mariyang road section of Yamne valley have been considered for the present study. The area under study lies in the East Siang district and is bound by latitudes 28°06'17"N to 28°14'25"N and longitudes 95°10'30'E - 95°18'00'E. This present study is aimed at elucidating the chemical composition of plagioclase, clinopyroxene, ilmenite and chlorite present in the mafic igneous rocks of Yamne Valley in order to understand the geotectonic and geothermobarometric conditions. The studied basaltic rocks are albitized to spilites suggesting late magmatic metasomatic process. The mineralogical assemblage of these rocks is plagioclase ( $Ab_{52-98}$ ), clinopyroxene ( $En_{18}Wo_{32}Fs_{15}$  to  $En_{49}Wo_{47}Fs_{37}$ ), Fe-Ti oxides and chlorite ( $Ca < 0.10$  apfu). Clinopyroxenes are Ca-rich ( $Wo_{32-47}$ ) and Na poor ( $Na_2O < 0.44$ ). The estimated pressure and water content of the magma by using clinopyroxene compositions are  $< 5$  Kbar and 10%  $H_2O$  for basalt and gabbro respectively which suggests that the magma chamber was located  $< 16-23$  km below the earth's surface. Crystallization temperatures yield 1080°C - 1109°C and 1032°C - 1070°C for basalt and gabbro, respectively. The mineral compositions of the studied rocks have indicated mostly an Ocean Floor Basalt (OFB) tectonic environment which was supposed to have been associated with Mid Oceanic Ridge Basalts (MORB) formed in an extensional environment.

*Keywords:* Yamne Valley, Spilite, Abor Volcanics, Mineral Chemistry, Geothermobarometry,