

## **PALAEODEPOSITIONAL ENVIRONMENT OF TURA SANDSTONES, UPPER ASSAM BASIN, INDIA: INFERENCE FROM SEDIMENTOLOGY AND GEOCHEMISTRY**

N. Sahariah and P. Bhattacharyya

*Department of Applied Geology, Dibrugarh University, Dibrugarh, Assam, India.*

*E-mail: nishantasahariahns21@gmail.com*

### **Abstract**

In Upper Assam shelf, the Paleocene-Early Eocene Tura Formation is the oldest sedimentary sequence, resting unconformably over the Precambrian Gneissic Complex (basement) and which in turn is overlain by the carbonate dominated Sylhet Formation. Although there are reports on sedimentological studies including reservoir properties and hydrocarbon prospects of Tura Formation, detailed geochemical analysis of these rocks is scanty. In recent years, whole-rock geochemistry is considered to be one of the tools to understand the depositional set-up of Tura sandstones. In the present study, clay mineralogy and whole rock geochemistry of the sandstones have been carried out to understand the palaeodepositional and palaeoclimatic conditions of the Tura sandstones. Based on framework composition and geochemistry, the sandstone is classified as quartz - arenite, sub-litharenite and wacke. X-ray diffraction analysis (XRD) of Tura Formation shows the presence of abundant kaolinite with lesser amounts of illite, chlorite and smectite – montmorillonite mixed layers. The presence of these clay minerals is also authenticated through scanning electron microscopic (SEM) analysis of the studied sandstone samples. Clay mineralogy and geochemical data suggest fluvial or deltaic depositional environment for the Tura sandstones during the Palaeocene. It is suggested here that there was a remarkable change in the tectono-sedimentary setting from Eocene onwards, as the Tura sediments show more affinity towards shallow marine depositional conditions under a hot and humid climate due to the presence of abundant glauconite and foraminiferal assemblages in the studied samples which indicates a shallow marine environment during the Early Eocene.

**Keywords:** Tura Formation, Geochemistry, Depositional setup, Paleoclimate, XRD.