Clay is a common component in sedimentary rocks especially mudstone. According to earlier studies (Nakano, 1967; Hesse, R., 1975; Sintubin, 1994), the size of clay particles is generally smaller than 2m, whereas silt particles are larger than 2m. Clay mineral assemblage in Sumatra mudstone is mainly composed of illite, smectite, and chlorite + kaolinite (dominated by chlorite). Mica (both illite and chlorite) particles are observed both in the silt and clay particle size range. In Unit-I and II, dominant clay mineral is illite.

|  |  |  |  |
| --- | --- | --- | --- |
|  | | **Particle Size** | |
| Clay (<2m) | Silt (>2m) |
| **Mineralogy** | Clay (e.g.,1Md illite) | Clay | *NA* |
| Mica (e.g., 2M1 illite) | Clay | Mica |

Table S1: Particle size and mineralogical description of clay.