Identification of clay minerals in Cheleken reservoir series in South Caspian and its application for determination of drilling mud type

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Abstract: Siliciclastic sediments of the Cheleken Series (Lower to Middle Pliocene) are exposed along the northern flank of Elburz Mountain Range. The goal of this study is to identify the clay mineral type in these siliciclastic sediments in Mazandaran and Golestan regions, because this can help in the prediction of drilling mud type that can be used. 23 samples have been collected from Neka, south of Ghaem Shahr and Alamdeh regions. Petrographic and XRD analysis revealed that sandy siliciclastic sediments with conglomerate interbeds are mainly consists of quartz, calcite and clay minerals. Illite and kaolinite is the major and monmorillonite and chlorite are the minor clay minerals in these sediments. Based on these types of clay minerals in study area, we suggest that the best drilling mud for using in these sediments are salt/polymer water – based mud with a suitable amount of potassium salts. Because these materials are available in Iran and they are relatively less expensive as well as potassium with low ionic diameter has the least problems during cation exchange in clay minerals that present in cheleken series.

Keywords: Clay Minerals, Drilling Mud, Cheleken Sediments.