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Assessment of Oligocene Sandstone for Glass Industry: Case study of Halkani Sandstone Member, Sona Pass area, Karachi Pakistan

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Abstract: Present study is carried out for the assessment of Halkani sandstone cropping out in the southwestern part of Karachi city. For this purpose, 20 rock samples were collected along Sona Pass area for geochemical and petrographic examination. Petrographic data revealed that the sand is mainly composed of quartz grains followed by feldspar and mica minerals in traces. Particle morphology revealed that mostly the sand is well sorted, sub rounded to angular where some grains show microfractures. Grain size analysis discovered that Halkani sand has 0.149 mm (100 mesh) size as modal class followed by 80 and 200 mesh. Chemical analysis revealed that silica content is about 86.2%. The mean concentration of Fe_2O_3 is 2.16% which is double the standard guidelines (< 1%). Conversely, mean concentration of Al_2O_3 is 2.96% which is within allowed limit of US standard (< 4%). Other major oxides including CaO (mean: 0.9%), MgO (0.44%), Na_2O (0.3%) and K_2O (0.32%) are within corresponding desired limits. Other trace elements (Cr_2O_3, ZnO, CoO, TiO_2, CuO, BaO) varied between 0.03-0.2%. the mean wt% of B_2O_3 is 15.33% which is slightly above fiber glass requirement (10%). This sand is devoid of NiO, MnO and PbO (below detection level). These results indicate that Halkani sandstone is generally suitable for various types of glass. Further beneficiation can improve it for high grade glass manufacturing.

Keywords: Sandstone, silica sand potential, glass industry, Karachi.

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