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Shale Gas Resource Characteristics of The Triassic-Jurassic Akgöl Formation Shales (Küre, Inebolu)

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The total organic carbon content, organic matter type, overmaturity of the samples and amount of silicate minerals of the Triassic-Jurassic Akgöl Formation shales (about 240 m in thickness) display similar characteristics of the well known shale gas resources in the United States and Canada. The Akgöl Formation extends in an area between Küre and Inebolu which is a part of Intra Pontide Zone of Alpine orogenic system. The objectives of this study were to assess the quality of organic matter found in shales, evaluate their thermal maturation and highlight their hydrocarbon potential as a source rock. Additionally, determination of shale gas characteristics of the Akgöl samples have been realized using organic geochemical data including total organic carbon content. The total organic carbon values of the shales ranging from 0.49 to 4.29 (wt %) indicate a good source rock potential. However, the low S1 and S2 peak values less than 2 mg HC/g rock and low Hydrogen Index values between 8 and 38 mgHC/gTOC imply very poor hydrocarbon generation potential. According to the results of Rock Eval parameters such as S1, S2, Tmax, HI and OI values imply that Type IV (Gas Prone) kerogene and source rock maturity in overmature. Addition to these results, Tmax based calculated vitrinite reflectance values (> 2.2 % VRoe), The Triassic-Jurassic Akgöl shales are thermally overmature. This correspond with illite crystallinity degrees and sharpness ratio of the illite minerals found in the samples. Illite crystallinity values are between 0.30 and 0.42, indicating "Ankizone" and sharpness ratio values of 2.40-5.89, indicating also "Ankizone". According to the results of XRD analyses of whole rock analysis, the two most abundant component of mica and clay minerals (illite, chlorite and kaolinite) (mica: 15:36% - 27.47%, clay minerals: 56.19% - 69.04%). Other minerals of quartz (average: 8:08%), feldspar (average: 7.76%), calcite (average: 0.66%).