The Tuwaiq Mountain and Hanifa formations are important reservoirs and source rocks of the Jurassic petroleum system in the Arabian basin. Total organic carbon (TOC) fairway maps of the Tuwaiq Mountain and Hanifa source rocks can offer great insights in defining source rock distribution. Laboratory measured TOC is not always available, hence integrating core-derived geochemical data with well-log responses can be used to characterize the source rock properties. This paper addresses the application of one such method in the study of source rocks of Tuwaiq Mountain and Hanifa formations.

Using the Rock-Eval Pyrolysis approach, organic geochemical analyses of core samples for S2, TOC, hydrogen, and oxygen indexes are used to determine the quality of organic matter. Most of the source rocks are thermally mature and contain oil prone Type II kerogen. The Delta Log R method is used to obtain calculated TOC values to increase the coverage across the zone of interest (uncored intervals) and laterally in uncored wells. This method requires the level of maturity as one of the key inputs. It is derived from predicted vitrinite reflectance values using heat flow distribution within the entire basin. Calibration of the TOC values from actual laboratory measured TOC values from core samples with values derived from Delta Log R method has been shown to be in good agreement, and this gives confidence when applying the technique to calculate TOC values in uncored wells.