Age-Dating of Pre-Khuff Strata in Kuwait: A Multidisciplinary Approach Based on Radiometric Dating and Palynology

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Abstract

The Palaeozoic is becoming an important target for exploration in Kuwait. Stratigraphic well-control is essential to develop accurate geological models which enables the development of successful prospects. Due to a lack of microfossils in pre-Khuff Palaeozoic red-bed strata commonly applied biostratigraphic age-dating techniques are not sufficient to develop high resolution chronostratigraphic models. Since a radiometric age-dating study of K-Ar analyses of illites (Strohmenger et al., 2003), It is the general conclusion that Paleozoic deposits subcropping beneath the pre-Khuff unconformity in the greater Burgan area of Kuwait are of Cambrian age. This implies that important Paleozoic source rocks known to be present elsewhere in the region are not present in this area. K-Ar age dating on illites however has the potential of producing erroneous age-determinations, especially when applied in depositional settings where the source of the illite cannot be verified. In a Cambro-Ordovician dated section of a well in the Burgan area, palynological remains of higher plants were recovered which contradicts the illite ages of this interval as provided by Strohmenger at al. (2003). The recovered fossils can not be older than Devonian, and are more likely of Carboniferous-Permian age. The presence of younger Paleozoic deposits in the Burgan area would greatly change the views on the petroleum system of the area and hence a re-investigation of the age-dating of these deposits was started. In this paper we will present the most up-to-date palynological analyses combined with a new more accurate K-Ar geochronology. Furthermore, the more reliable Ar-Ar methodology has been applied on volcanic ash layers recovered from some wells. The conclusions of this study will be presented and discussed in this presentation.