

WA Branch

The Role Of Sulphur In The Formation Of Petroleum

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The study of sulphur in sedimentary systems is of importance from both a practical and academic viewpoint. Up until the 1980s the impetus for research into sedimentary sulphur arose from problems encountered when exploring for, exploiting, refining and burning fossil fuels. Over the last decade however, research into the geochemical significance of sulphur in fossil fuels has progressed significantly. It is now apparent that sulphur plays a key role in the preservation of organic matter in sedimentary rocks and the subsequent

release of petroleum when the rocks are heated in the subsurface.

Microbial sulphate reduction in the depositional environment generates reduced inorganic sulphur species from the sulphate contained in marine or saline waters. The reduced sulphur then becomes incorporated into sediments as metal sulphides and/or organically bound sulphur. In the case of organic sulphur, particular hydrocarbons may be bound through sulphur to the organic matrix. Because

carbon-sulphur bonds are labile, these bound hydrocarbons may be released as petroleum under mild heating. The presence of these weak bonds appears to be related to the early generation of petroleum in systems that involved saline waters. The present study illustrates how the presence of some sulphur-bound chemical fossils or biomarkers can provide information about marine incursions into terrestrial depositional systems - a key factor in determining the oil or gas character of source rocks.