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EASTERN DEVONIAN SHALES: ORGANIC GEOCHEMICAL STUDIES, PAST AND PRESENT

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ABSTRACT

The Eastern Devonian shales are represented by a sequence of sediments extending from New York state, south to the northern regions of Georgia and Alabama, and west into Ohio and to the Michigan and Illinois Basins. Correlatives are known in Texas. The shale is regionally known by a number of names: Chattanooga, Dunkirk, Rhinestreet, Huron, Antrim, Ohio, Woodford, etc. These shales, other than those in Texas, have elicited much interest because they have been a source of unassociated natural gas. It is of particular interest, however, that most of these shales have no associated crude oil, in spite of the fact that they have some of the characteristics normally attributed to source beds. This paper addresses some of the organic geochemical aspects of the kerogen in these shales, in relation to their oil generating potential. Past organic geochemical studies on Eastern Devonian shales will be reviewed. Recent solid state ^{13}C NMR studies on the nature of the organic matter in Eastern Devonian shales show that Eastern Devonian shales contain a larger fraction of aromatic carbon in their chemical composition. Thus, despite their high organic matter contents, their potential as a petroleum source rock is low, because the kerogen in these shales is of a "coaly" nature and hence more prone to producing natural gas.