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Organic petrography of the Upper Cretaceous Mancos Shale in the San Juan Basin, New Mexico, USA

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The San Juan Basin is one of the largest hydrocarbon provinces in the USA. The Upper Cretaceous Mancos Shale preserves sufficient amounts of organic matter, which have sourced many hydrocarbon-producing horizons. Detailed organic petrography of 27 core samples showed two distinct maceral groups in vertical profile. Group-1 dominates the majority of the studied section and is characterized by abundant fluorescing bituminite with lesser quantities of alginite and liptodetrinite. Group-2 represents a brief intercalation within the upper part of the section and is composed mainly of vitrinite and pyrite. Both groups contained smaller quantities of inertinite, mainly as reworked and weathered particles of vitrinite. Such maceral composition reflects an overall mix of Type-II and Type-III kerogen (oil and gas prone). Moreover, the maceral assemblages in the sandstone and sandy siltstone intervals of the Mancos Shale consists almost entirely of recognizable features of solid bitumen indicating migration pathways for hydrocarbon. The general character of the Mancos Shale organic matter in the studied interval suggests accumulation under changing oxygenation conditions, leading to variable degrees of organic matter degradation.

Key words: Mancos Shale, Organic Petrography, San Juan Basin, Bituminite, Solid Bitumen, Vitrinite