

FACTORS CONTROLLING API GRAVITY VARIATIONS AMONG TRINIDAD CRUDES

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ABSTRACT

One of the earliest oil producing countries, Trinidad lies at the eastern offshore limit of the prolific Eastern Venezuela Basin where cumulative production has reached 10 billion barrels, with recoverable reserves estimated at 40 billion barrels. This basin is also the habitat of the Orinoco Tar Belt, the largest known heavy oil occurrence (1.2 trillion barrels of oil in place).

Trinidad's cumulative production of 2.6 billion barrels includes oils of gravities varying from 10⁰ API to 60⁰ API, but are mostly in the 20⁰- 40⁰ API range. Heavy oils (10-20⁰) occur in both shallow (<1515 m) and deep (>2424 m) reservoirs. Three hundred and fifty oils, covering all the known reservoirs of Upper Cretaceous, Eocene, Miocene and Pliocene age, were analysed to establish the critical factors controlling oil gravity and to determine its predictability. Oils were assessed for maturity, organic facies sourcing, and the effects of post-generative alteration processes using data derived from gas chromatography, mass spectrometry, and sulfur and trace metal contents.

Oil gravity variations in Trinidad oils appear independent of depth, age, or geographic location of reservoirs and probably reflect complex compositional differences attributable primarily to variable oil maturities and alteration associated with biodegradation, evaporative fractionation, and mixing of oils through remigration.