

Abstract Submitted  
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**Preliminary Results of Plasma Induced Hydrocarbon Reforming of Heavy Gas Oil (HGO) as part of an Ongoing Multiple Regional Heavy Crude Oil Field Sample Hydrocarbon Reforming Study.**<sup>1</sup> JAMIE KRAUS<sup>2</sup>, Texas AM University, KUNPENG WANG, Texas AM University/LTEoil, ABDULLAH BAKY, CHRISTOPHER CAMPBELL, SHARIFUL ISLAM BHUIYAN, DAVID STAACK<sup>3</sup>, Texas AM University, HOWARD JEMISON, LTEOIL (Project Sponsor) — Heavy gas oil (HGO) was collected in the field upon exiting the vacuum distillation unit (VDU) before entering the HGO hydrotreater unit at a refinery. HGO is fed into a hydrotreater with other lighter gas oil constituents to meet the feed requirements of the fluidized catalytic cracking unit (FCCU). The main product from the FCCU with hydrotreated HGO feed is gasoline-range hydrocarbons; however, unfavored products such as aromatics, residue, and coke are formed as a biproduct which rapidly diminishes the life span of the high capital cost catalyst within the FCCU due to fouling. Experiments were conducted with an induced nanosecond pulsed plasma spark in HGO with bubbling hydrogen-rich gas inside a designed and constructed oil treatment reactor (OTR) to investigate the high chemical conversion potential and commercial feasibility of hydrocarbon reforming of HGO using plasma technology with a full mass balance on the liquid, condensate, and solid constituents. Preliminary results indicate the induced chemical reactions by plasma favor cracking and conversion of heavy diesel-range hydrocarbons into lighter gasoline-range hydrocarbons while increasing the cetane number in the treated gas-oil mixture and condensate with an unexpected high-yield of benzene.

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