

**Study on the conversion of waste plastics/petroleum resid mixtures to transportation fuels.**

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**Abstract**

Catalytic co-processing of model and waste plastics with light Arabian crude oil residue was assessed using NiMo/Al<sub>2</sub>O<sub>3</sub>, ZSM-5, FCC, and hydrocracking catalysts. Studied reaction systems included low d. and high d. polyethylene (LDPE, HDPE), polystyrene (PS), and polypropylene (PP). Several single (plastic/catalyst) and binary (plastic/residue/catalyst) reactions were performed in a 25 cm<sup>3</sup> micro-autoclave reactor under different catalyst type and wt., duration, pressure, and temp. conditions. Optimum conditions selected were: 1% catalyst by wt. total feedstock wt., 60 min reaction time, 8.3 Mpa H<sub>2</sub>, and 430°. Product distribution for a binary system using plastic and petroleum residue provided some encouraging results. High yields of liq. fuels in a 100°-480° boiling range and gases were obtained along with a small amt. of heavy oils and insol. material, e.g., gums and coke. This study helped demonstrate the tech. feasibility of upgrading waste plastics and petroleum residue and an alternative approach to feedstock recycling.