

CATALYTIC CRACKING CATALYSTS

INTRODUCTION

SINACO is committed to meet the customers' operational success with our high performance refinery catalysts. We supply various type of refinery catalysts for Fluid Catalytic Cracking and Deep Catalytic Cracking processes. We provide catalysts formulated through highly effective and advanced development techniques to meet the increasingly complex business needs of our clients.

FCC CATALYST

To meet the ever-changing demand for bottom-of-the-barrel upgrading and fuel specifications, we offer unique catalytic solutions to crack feedstocks ranging from lightest to the heaviest into higher-value products.

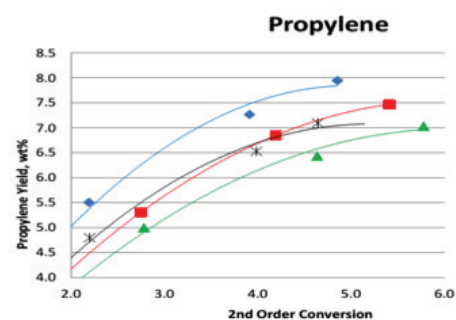
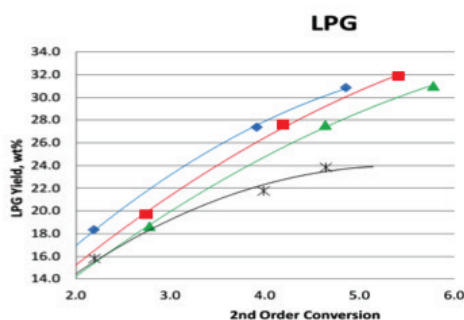
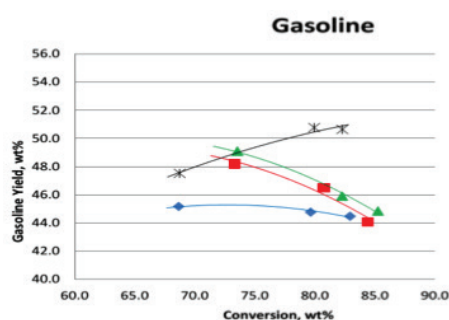
Heavy Metal Resistance (HMR)

Our metal trapping technologies reduce the vanadium mobility and protect the zeolite structure which enable high level of zeolite stability. The HMR catalyst reduces metal coke and hydrogen influenced by nickel with minimal dehydrogenation, the combination of higher activity zeolite enhanced catalytic cracking over thermal cracking, which also reduces the kinetic coke and dry gas make.

Designated as high activity Y-catalysts, HMR catalyst was evaluated on ACE unit by a global FCCU licensor in 2013 and achieved the guaranteed high activity & high metal tolerance required for heavy feed. The evaluation is carried on different Cat/Oil Ratio of 3, 6 and 9, constant reaction temperature of 1000°F, 2g/min feed injection rate. The properties of typical VGO and residue are listed.

PROPERTIES OF FEEDSTOCK IN EVALUATION

Item	VGO	Residue
API Density	25.8	14.4
CCR, wt%	0.44	10.7
Hydrogen, wt%	12.7	10.55
Vanadium, ppmw	0.39	32
Nickel, ppmw	0.25	9.2



DCC CATALYST

With the unique design, our DCC catalyst is formulated to maximize propylene production through minimizing unwanted secondary cracking and maximizing selectivity of propylene. The product increases propylene production regardless of what the feedstock quality is - from light gas oils to heavy residues including wax oil, wax oil blended with residue, CGO, DAO and AR.

Enhanced Light Olefins (ELO)

The unique ELO catalyst design optimized balance between micro, meso and macro-pore structures, the proprietary zeolites technology of ELO catalyst maximize the conversion of the feed molecules to gasoline olefins precursors, maximize the subsequent cracking of the precursors to propylene and minimize the undesirable competing reactions that consume the propylene precursors.

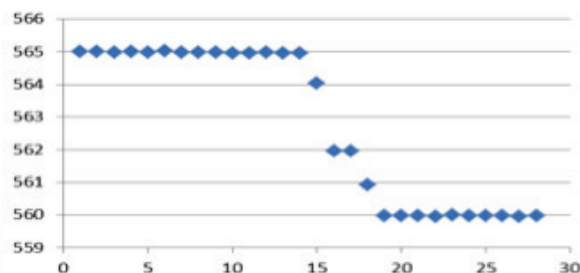
Not limited to DCCU in VGO and residue cracking, ELO catalyst can also be formulated for FCCU to boost propylene and even Isobutylene yield.

The commercial application in DCCU of a major Refinery shows significant increase in propylene yields, good hydrothermal stability and satisfied heavy oil conversion ability.

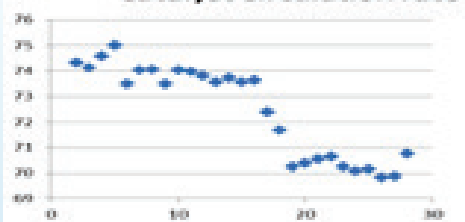
PROPERTIES OF FEEDSTOCK IN EVALUATION

Specific Gravity, g/ml	0.89-0.90	Fuel Gas	9.19	9
N+V, ppmw	<0.01 ea	PGP	17.73	18.1
CCR, wt%	<0.1	C3+C4	23.38	23.58
Operating Conditions		Gasoline	26.31	26.72
ROT, degC	565 560	LCO	14.78	14.05
Reactor level, %	78.75 79	Slurry	0.85	1.05
Steam to Riser, wt% of feed	21.37 22	Coke	7.77	7.5

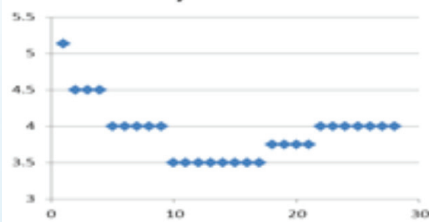
ROT Deg C



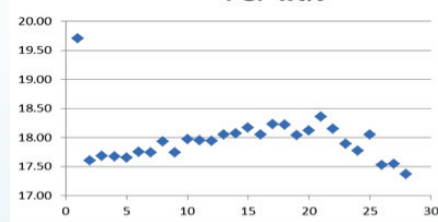
Catalyst Circulation rate



Catalyst addition



PGP wt%



TECHNICAL SERVICE

Our Technical Support Team provides report that is made available to all of our customers. These reports record the refinery management with an ongoing systematic evaluation of their FCC/DCC operating conditions together with the impact of the catalyst to support the strategic direction of the FCC/DCC management. Our service covers e-catalyst analysis with feedback within 10 working days, on-site technical support and 48 hours respond time for solution to all reported technical issue.