

# **Thoxcat ES<sup>TM</sup>: A Novel LPG Sweetening Catalyst**



The process for converting mercaptans into less deleterious disulfides is termed as sweetening. CSIR-IIP and BPCL have developed a homogeneous sweetening catalyst, Thoxcat ES<sup>™</sup>, which helps conversion of mercaptans present in LPG into disulfides in a very cost effective manner. Mercaptans are undesirable due to their foul smell, corrosive nature and adverse effects on downstream catalysts. The mercaptans present in LPG are first extracted with alkali and subsequently oxidized in presence of Sweetening Catalyst in to disulfides is our licensed manufacturing partner.

# Thoxcat ES<sup>™</sup> Specifications

- Dark Blue Liquid solution
- Odorless
- Specific gravity @15/15°C: 1.06 ±0.02
- Active ingredient, kg/bottle: 0.5 in 4.7 liters

Comparative Performance: 1.5MMTPA LPG Plant		
Parameters	Thoxcat ES	Reference
LPG Feed	FCC + Coker	FCC + Coker
Feed RSH	400-750 ppm	400-750 ppm
Product RSH	4-15 ppm	4-15 ppm
Catalyst Cost/Month	800 USD	1800 USD

# Commercial Status: Refineries using Thoxcat ES<sup>™</sup>

- BPCL- Mumbai, India
- BPCL-Kochi, India
- HPCL-Vishakhapatnam, India
- HPCL-Mumbai, India
- Bharat Oman Refinery Ltd, Bina, India
- HMEL- Bhatinda, India
- MRPL- Mangalore, India
- IOCL- Digboi, India
- IOCL- Paradip, India
- Reliance Industries Limited Jamnagar, India
- ORPIC, Sohar Refinery, Oman
- Saudi Aramco, Saudi Arabia

# **Development and License**

- Jointly developed by CSIR-IIP and BPCL
- Currently licensed for production to Lona Industries Ltd, Mumbai, India



# **Applications & Advantages**

- Extractive sweetening of LPG
- Liquid-liquid sweetening of lighter petroleum fractions like naphtha or light cracked gasoline
- Drop in Catalyst No changes in existing LPG Sweetening plant required
- Higher activity, comparable stability with leading international sweetening catalysts
- Lower catalyst consumption due to higher activity
- Competitively priced, cost effective in use
- Shelf life of 3 years

# Patents

- 9 Granted, including
- US 6565740, US 6740619, IN 220176, IN 226702, IN 230888

# Awards

- CSIR Technology award for Innovation 2007
- OCEANTEX 2008 Outstanding Achievement award – R & D
- DST-Lockheed Martin India 2010 innovator's Award
- Most Significant CSIR Technology Award 2015