

Course Content



Title: HF Alkylation

Potential PDH: 16 **Code:** BTT071

Description:

The HF alkylation process is an important part of modern refinery gasoline production. This program, “HF Alkylation Process Technology,” has been developed by Refining Process Services to provide an in-depth yet practical review of HF Alkylation Unit Operation. The speakers will cover topics ranging from the basic process principles through items of current interest such as operations troubleshooting and methods of HF detection and leak mitigation. Key process variables such as feedstock quality, reaction conditions, and catalyst composition will be discussed. Various unit configurations by both UOP and Phillips Petroleum licensors will be reviewed and control of the unit to meet product specifications will be taught. A thorough understanding of these principles is required for safe and reliable operation of the HF alkylation unit.

Program participants will have the opportunity to obtain a broad working knowledge of the HF alkylation process including some history of the process and important metallurgy and corrosion aspects. Participants will be invited to submit questions for discussion during the program.

Outline:

Introduction to HF Alkylation

- Basic Reactions
- The Liquid Acid Catalyst
- Basic Process Flow
- Brief History
- Alkylate Value

HF Alkylation Process Flow

- Feed Preparation
- Reaction Section
- Product Fractionation
- HF Stripping and Acid Regeneration
- Product Treatment
- Neutralization Systems

HF Alkylation Principles of Operation and Chemistry

- Distillation
- HF and Water Stripping
- Adsorption Drying
- Alkylation Reactions
- Defluorination and Neutralization

Safety and Environmental

- Personal Protective Equipment
- Chemical Hazards
- Waste Management
- Safety Systems

Process Control

- Feed Drying
- Reactor Parameters Control
- Fractionation
- Acid Regeneration
- Product Treatment

Operational Objectives

- Minimize Feed Impurities
- Maximize Alkylate Production and Quality
- Minimize Acid Losses
- Produce Specification LPG's

Equipment Reliability

- Reliability Concerns
- Iron Fluoride Scale
- Corrosion Parameters
- Bimetallic welds
- Effects of Hydrogen

Emergencies and Mitigation

- Emergency Response
- Detectors and Cameras
- Isolation Valves
- Water Mitigation
- Acid Transfer System

Troubleshooting

- Equipment Malfunctions
- Reactor Conditions
- Acid Purity
- Product Quality
- Corrosion

Design Guidelines

- Materials of Construction
- Feed Preparation
- Reaction System
- Fractionation System
- Acid Regeneration System

Instructor:

Daryl is a Senior Consultant with Becht Engineering and resides in Longview Texas. He provides consultation on alkylation operations, refinery troubleshooting, customer training, project support, and technical support for accident investigations. His prior employment was with Conoco, ConocoPhillips, and UOP/Honeywell. He has extensive experience in alkylation troubleshooting, audits on HF Alkylation units, alkylation unit design, and training of alkylation unit operators, engineers, and supervisors. Daryl

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also served on the staff of ConocoPhillips and UOP Worldwide HF Alkylation Symposia from 2004 to 2016.

Daryl holds a BS in Chemical Engineering from Iowa State University.