

COMMODITY POLYMERS MANUFACTURING

OBJECTIVES

To bring broad technical information on polymers & polymerization processes used to produce polyethylenes, polypropylenes, polyvinylchloride, polystyrene.

On completion of the course, the participants have acquired:

- basic principles of polymerization techniques used & main characteristics of manufactured polymers
- main polymerization processes & operating conditions ranges in industrial examples
- main polymers transformation techniques, applications and corresponding market shares

▲ Who should attend?

Personnels working in the petroleum and petrochemical sectors looking for an introduction to the petrochemical aspects of olefins and aromatics.

COURSE CONTENT

POLYMER TYPES & NATURE

0.25 day

Polymer constitution: monomers, macromolecules, building blocks.

Various kinds of polymers: fibers, elastomers, plastics.

Plastics types: thermoplastics and thermosets.

Main commodity plastics: polyethylenes, polypropylene, polystyrene and polyvinylchloride.

Economical aspects regarding these commodity plastics.

▲ Duration

3 days

POLYMER PRODUCTION - ASSOCIATED PROPERTIES

1 day

Main polymerization reactions: polyaddition, polycondensation.

Basic characteristics of polymer reactions: heat of reaction, activation mode...

Different arrangements of monomer building blocks in polyaddition: atactic, syndiotactic or isotactic polymers; random block; graft; alternate polymers.

Relationship between end uses implementation and main polymer properties.

Influence of monomer building blocks arrangements regarding polymer properties.

Main tests used to get polymer characterization: melt index, viscosity index, ... Test signification, relationship with polymer structure.

Consequences regarding polymer implementation techniques (extrusion, injection, ...)

▲ Dates & Location

Non-scheduled

May only be organized for a single company

POLYMERIZATION IMPLEMENTATION - MAIN COMMODITY PLASTIC PROCESSES

1.75 days

Techniques implemented to produce polymers: solution, bulk emulsion, suspension, gas phase techniques.

Advantages and drawbacks of those different techniques consequences on processes implementation.

Examples applied to main processes used to manufacture famous thermoplastics: polyethylenes (PE), polypropylene (PP), polystyrene (PS) and polyvinylchloride (PVC).

Flowcharts and principles of processes. Some common and average operating conditions.

Influence of operating parameters (temperatures, pressures, monomers ratio and proportion of any chemicals involved in the reaction) regarding the quality of polymer obtained.

Some pretreatments of polymers out of reactor before transformation step.

▲ Tuition Fees

To be agreed upon

▲ Course Coordinator

Philippe Bossennec

Ref. **PTF / PPLAS-E**