

Polypropylene 101

1. Monday, Dec 7, 2020, 09:00-12:00 PT

Polymer Structure and Morphology

- a. PP Resin Types
 - i. Homopolymer
 - ii. Random copolymer
 - iii. Impact copolymer
 - iv. Applications & properties of PP
 - v. PP catalysis and production
 - vi. How to read a PP data sheet and resin selection
- b. Melt Phase Properties
 - i. Rheology and melt flow behavior
 - ii. Shear & extensional viscosity
 - iii. Melt strength
- c. Influence of Molecular Weight and (MWD) on Controlled Rheology PP

2. Tuesday, Dec 8, 2020, 09:00-12:00 PT

Fabrication Processes

- a. Injection Molding
- b. Surface modification of PP
- c. Welding
- d. Optional if there is interest
 - i. Extrusion
 - ii. Melt Spinning
 - iii. Blow Molding
 - iv. Thermoforming
 - v. Rotomolding
 - vi. Film Production (Cast, Blown, & Oriented Film)
- e. Solid State Structure
 - i. Crystalline Hierarchy (unit cell, lamellae, spherulite)
 - ii. Tacticity
 - iii. Primary & Secondary Crystallization
 - iv. Dispersed rubber phase morphology in impact copolymers
 - v. Techniques for identifying and quantifying crystal types
 - vi. Nucleation

3. Wednesday, Dec 9, 2020, 09:00-12:00 PT

Additives

- a. Stabilizing Additives**
 - i. Processing stabilizers (primary & secondary)**
 - ii. Light & radiation resistance**
 - iii. Long term thermal stabilization**
- b. Functional Additives**
 - i. Acid scavengers**
 - ii. Antistats & Antifogs**
 - iii. Mold release agents**
 - iv. Optical brighteners**
 - v. Crystal nucleants & clarifiers**
 - vi. Optional**
 - 1. Antiblocks (for film)**
 - 2. Chemical & physical blowing agents**
 - 3. Coupling agents**
- c. Chemical interactions of polypropylene**

About The Instructor

Dr. Philip Jacoby received his Ph.D. in Physical Chemistry from the University of Wisconsin in Madison, Wisconsin. He was a Senior Research Associate with Amoco and BP-Amoco in the Polypropylene Product Development group for more than 26 years. He holds 13 US patents and several international patents covering various polypropylene products, with emphasis on the use of Beta Nucleation in polypropylene. While at Amoco he developed a new business involving the production and sale of microporous PP breathable/waterproof film, and he authored six US patents on this technology.

He joined Mayzo, Inc. (an additive and release coat supplier) as VP of Technology in October, 2002. While at Mayzo he developed an entirely new business based on the production and sale of Beta Nucleant masterbatches for use in polypropylene. He also authored several additional patents. He has also written numerous technical articles involving PP technology, and authored a book entitled "Beta Nucleation of Polypropylene". He is a past president of the Southern Section of the Society of Plastics Engineers (SPE), and a former board member of the Thermoforming Division of the SPE. He retired from Mayzo in March, 2014, and now does independent consulting.

Specialties: Polyolefin technology and product development. Polypropylene structure-property relationships.