6 hours

Advances in Sustainable Chemicals

Advances in sustainable chemistry are essential to the environmental and climate challenges we face. The course offers participants an overview of advances in sustainable chemical production and an understanding of how the markets are reacting to these developments.

INSTRUCTOR

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COURSE OUTLINE

- **1. Agricultural Background and Biofuels**
  - Legislation overview; feedstocks overview and carbon intensity including new fuels.
  - Blending routes - gasoline/diesel/aviation fuel
  - Biogas developments, Bio-methanol
  - RFNBOs – eFuels, hydrogen, etc.
  - Market overview, manufacturing costs
  - Carbon footprint + petrochemical feedstocks availability
- **2. Plastics Recycling**
  - Legislation overview, scoping the challenge
  - Market overview and development
  - Petrochemical value chain Integration
  - Technology Solutions
  - Production economics; carbon footprint implications.
- **3. Biodegradable Polymers**
  - Definitions, legislation overview
  - Market overview and development
  - Polymer families and building blocks
  - Technology Solutions
  - Production economics; carbon footprint implications.
- **4. Bio-based Plastics & Intermediates**
  - Definitions, legislation overview as appropriate
  - Market overview and development
  - Polymer families and building blocks
  - Technology Solutions
  - Bio-based Polyolefins, Bio-based Polyesters, Bio-based Nylons; novel bio-based polymers (bio-PBT, bio-PC, etc.)
  - Comparative production economics, carbon footprint implications.
- **5. Carbon Dioxide**
  - Market overview and development, major sources
  - Technology solutions for CCS/CCSU and re-use
  - Air capture, Amine systems, colored methanol
  - Screening emerging applications
  - Comparative production economics
  - Introduce impact on biofuel/chemical operations.
- **6. More Sustainable Petrochemical Building Blocks**
  - Definitions, Legislation overview as appropriate
  - Market overview and development – focus on production.
  - Low carbon building blocks and footprint
  - Ethylene, propylene (conventional, bio-naphtha/propylene/MTO, circular naphtha/propylene/FCC, PDH)
  - Benzene (conventional, bio-naphtha, reforming, unconventional)
  - Methanol
  - Alternative approaches to reduction in scopes 1, 2, and 3.
  - Cracker, PDH electrification,
  - Hydrogen-fired furnaces in steam cracking.
  - Comparative production economics
  - Impact of developments in CO2 pricing on competitiveness