

Qatar Training in Polymer Science and Composites

28th November – 2nd December 2010

Day 1 28th November 2010

08:00 Introduction (JRE)

Concepts; definitions; examples

09:00 Polymer Solubility and Solutions (BJH)

Ideal and non-ideal behaviour; solution viscosities; viscometry (M_v).

10:00 Break

10:30 Chain Reaction Polymerization (JRE)

Radical, ionic and coordination mechanisms; examples; laboratory and commercial practise.

11:30 Molecular Weights and their Measurement (BJH)

Size exclusion chromatography (SEC); osmometry (M_n); light scattering (M_w); other methods.

12:30 Lunch

13:30 Step Reaction Polymerization (JRE)

Condensation and rearrangement; examples; laboratory and commercial practise.

Day 2 29th November 2010

07:30 Water Soluble Polymers (JK)

08:30 Physical States and Thermal Transitions (BJH)

Amorphous and crystalline states; glass transition; melting; differential scanning calorimetry (DSC); dynamic mechanical thermal analysis (DMTA); microindentation

09:30 Identification and analysis of polymers and polymer additives - 1 (JRE)

Chemical, physical and spectroscopic methods for identifying polymers and additives

10:30 Break

11:00 Identification and analysis of polymer and polymer additives - 2 (JRE)

Spectroscopic methods for determining polymer composition, crystallinity, tacticity, chain branching

12:00 Lunch

13:00 Polymer Degradation and Stabilization (BJH)

Degradation mechanisms; polymer stabilizers; thermogravimetric analysis (TGA).

14:00 Selected Polymers, their Properties and Applications (JRE)

Polyolefins; polyamides and polyesters; synthetic elastomers; epoxy resins.

Day 3 30th November 2010

07:30 Polymer Composites: reinforcements, manufacturing and classification (AH)

08:30 Short and long fibre composites (AH)

09:30 Break

10:00 Irradiation Effects on Polymers (MA)

11:00 Polymers in industrial applications (AH)

12:00 Lunch

13:00 Laminate Theory (CS)

14:00 Design of composites for strength and damage resistance (CS)

Day 4 1st December 2010

07:30 Recycling and life cycle analysis of polymers (AH)

08:30 Nanocomposites (AH)

09:30 Break

10:00 Biodegradable Polymers (MA)

11:00 Creep, fatigue and dynamic mechanical properties in composites (CS)

12:00 Lunch

13:00 Hybrid composites (CS)

14:00 Environmental effects on the behaviour of composites (CS)

Day 5 2nd December 2010

07:30 Design and Fabrications of Polymer Composites (EM)

08:30 *Water Adsorption Behaviour -Case Study of Palm/Polypropylene Composite (RK)*

09:30 Break

10:00 Adhesives - case study on adhesive joints bonded with metal particle filled epoxy (RK)

11:00 Design and Fabrication of an Effective Polymer Composite Case Study: Wrap Repair System for High Pressure Pipelines (EM)

12:00 Lunch

13:00 Ion Beam Applications (NM)