



BASICS OF THERMOSETTING RESINS

TUTORIAL

24 SEPTEMBER 2018

BERLIN, GERMANY

Leonardo Royal Berlin Alexanderplatz

Otto-Braun-Strasse 90

10249 Berlin, Germany

ROOM: R 2

9.00 am – 4.00 pm

PROGRAM

9.00 am – Welcome

Short Introduction to Thermosetting Resins

Instructor: Monika Bauer

1. Principles
2. Processing
3. Properties and characterization prior to, during and after curing
4. Repair and recycling aspects

Chemistry, Processing, Properties, Characteristics, Applications

Instructor: Monika Bauer

1. Cyanates
2. Phenolics, including other formaldehyde resins (formaldehyde resins are the most used thermosets, phenolics were the first)
3. Epoxies (3rd in the market)
4. Short introduction to other thermosetting resins (e.g. benzoxazines, bisoxazolines, bismaleimides, polyimides, silicones, polyurethanes)

11:00 am – Coffee Break

Chemistry, Processing, Properties, Characteristics, Applications

Instructor: Reinhard Lorenz

Unsaturated polyesters, including vinylesters (2nd in the market)

1 pm - 2 pm – Lunch Break

Fibre Reinforced Materials

Instructor: Terry McGrail

1. Introduction to composite materials and matrix selection criteria
2. Comparison of thermosets and thermoplastics as composite matrices
3. High temperature composite matrices
4. Strategies for toughening brittle thermosetting matrices including soluble fibre technology
5. Challenges for the composites industry

4.00 pm – End of Tutorial

INSTRUCTORS

CURRICULUM VITAE – MONIKA BAUER

| | |
|-------------|--|
| since 2016 | Senior Scientist at <i>InnoMat GmbH</i> |
| 1998 – 2016 | Chair of <i>Polymeric Materials</i> at the <i>Brandenburg University of Technology Cottbus</i> , Germany |
| 1992 – 2015 | Director of the <i>Fraunhofer Research Institution for Polymeric Materials and Composites PYCO</i> in Teltow, Germany (1992-1997: Fraunhofer IFAM, Branch Lab Polymeric Materials, 1998-2007: Fraunhofer IZM, Branch Lab Polymeric Materials and Composites) |
| 1990 – 1992 | Build up of the Branch Lab for Polymeric Materials of the <i>Fraunhofer Institute for Applied Materials Research IFAM</i> |
| 1988 | Appointment as Professor at the <i>Academy of Sciences</i> , Teltow-Seehof, Germany |
| 1987 – 1990 | Head of the Polymer Synthesis Department at the <i>Institute for Polymer Chemistry (IPOC)</i> at the <i>Academy of Sciences</i> |
| 1987 | PhD B (Dr. sc. nat.) under the supervision of Prof. Dr. H. Frommelt at the <i>Central Institute for Organic Chemistry</i> (Title in German: <i>Netzwerkpolymere aus aromatischen Cyansäureestern (Network Polymers from Aromatic Cyanates)</i>) |
| 1979 | PhD A (Dr. rer. nat.) under the supervision of Prof. Dr. D. Martin at the <i>Central Institute for Organic Chemistry</i> (Title in German: <i>Cycloadditionen mit Cyansäureestern (Cycloadditions with Cyanates)</i>) |
| 1973 – 1987 | Scientific activities at the <i>Central Institute for Organic Chemistry</i> of the <i>Academy of Sciences (Akademie der Wissenschaften)</i> , Berlin, Germany |
| 1969 – 1973 | Chemistry studies at the <i>Dresden University of Technology</i> , Germany |

CURRICULUM VITAE – REINHARD LORENZ

| | |
|-------------|--|
| since 1999 | <p>Professor for <i>Polymer Technology and Polymer Chemistry</i> at the <i>University of Applied Science Münster</i>, Steinfurt, Germany.</p> <p>Areas of research:</p> <ul style="list-style-type: none"> - unsaturated polyester resins (UP-resins), SMC/BMC, relining, curing and VOC, - intrinsically antimicrobial polymers (thermoplastic and crosslinked materials), - tailor made compounds (flame retardancy, magnetic properties, ...). |
| 1989 – 1999 | <p>Research Chemist at <i>BASF</i>, Ludwigshafen, Germany.</p> <p>Areas of research:</p> <ul style="list-style-type: none"> - unsaturated polyester resins (UP-resins), GRP and shrink control, - polyurethanes, polyols, double metal cyanide catalysts and Poly(THF). |
| 1985 – 1988 | <p>Research Chemist at <i>Hoffmann-La Roche</i>, Bale, Switzerland.</p> <p>Research on synthesis and characterization of liquid crystal polymers.</p> |
| 1985 | <p>PhD (Dr. rer. nat.) under the supervision of Prof. Dr. R. Haase at <i>RWTH Aachen</i>, Institute of Physical Chemistry, Germany (Title in German: <i>Kalorimetrische Untersuchungen zum thermodynamischen Verhalten binärer flüssiger Systeme des Typs aliphatische Monocarbonsäure + Alkohole</i>).</p> |
| 1977 – 1983 | <p>Chemistry studies at <i>RWTH Aachen</i>, Germany.</p> |

CURRICULUM VITAE – TERRY MCGRAIL

| | |
|-------------|---|
| since 2010 | Director <i>Irish Composites Centre (IComp)</i> |
| 2008 – 2010 | Consultant |
| 2006 – 2008 | Technical Director, AMRC with <i>Boeing</i> , <i>University of Sheffield</i> |
| 2001 – 2006 | Strategic R&T Director, <i>Cytec Engineered Materials</i> , Wilton Centre, UK |
| 1996 – 2001 | Manager, Polymers and Composites Group, <i>ICI Technology</i> , Wilton Centre, UK |
| 1990 – 1996 | <i>ICI Company</i> Research Associate, Composite Materials, ICI Wilton Centre, UK |
| 1982 – 1986 | Senior Research Scientist, <i>ICI New Science Group</i> , Wilton Centre, UK |