

RESUME

Benjamin T. A. Chang

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Summary

A seasoned polymer research engineer with 22 years of experience in R/D of coatings, epoxy, composites, and thermoplastics and is a NACE certified coating inspector (#8090). In-depth understanding of the protective coating performance and market demand from end-user point of view. Strong background in characterization of coatings. Innovative skills to solve technical problems and conduct failure analyses. Broad contacts with both academic / industrial experts and coating suppliers.

Education

1980 Ph. D. in Materials Science, University of Rochester, N.Y.
1971 B.S. in Mechanical Engineering, National Taiwan University

R/D Experience

Staff Research Engineer, Shell Global Solutions (U.S.), Westhollow Technology Center since 1980

1. Protective Coatings

* Offshore Platform Coatings -

- (1) Established a test protocol for offshore platform maintenance coatings. Formed a new NACE STG03, TG#260 in 2001 to develop the new NACE standard on offshore atmospheric maintenance coatings.
- (2) Developed a test protocol for offshore ballast water tank and immersion coatings. Requesting the formation of a new NACE task group to develop a new NACE standard on ballast water tank coatings.
- (3) Developed a repair procedure for riser splashtron coatings.
- (4) Offshore flange corrosion control and fastener coating.
- (5) Established a test protocol for offshore new construction coatings.

* Pipeline Coatings

- (1) Developed test protocols for FBE and rehabilitation pipeline coatings, tapes, shrink sleeves.
- (2) Developed methodology to determine maximum service temperatures. Conducted extensive lab evaluation of pipeline rehabilitation coatings tapes and sleeves.
- (3) Prepared a coating specification for high temperature subsea pipeline 3 layer PP coatings
- (4) Prepared the technical specification for "Bituminous Enamel Coating of Steel Linepipe.

2. Epoxy Composites

* Mechanical Testing

Extensive experiences in composite testing - tensile, compression, shear, fatigue, creep, fracture toughness, crashworthiness, residual stress measurement for electronic epoxy encapsulation, acoustic emission testing, fiber-resin interfacial shear strength.

* Failure Analyses

Developed techniques in the failure analyses of composite leaf spring, FRP pipe, Insitupipe

* Epoxy Composite Processing

Worked with filament winding machine, pultrusion machine, reinforced injection molding, prepreg and autoclave, hand lay-up, compression molds.

3. Polymeric Materials

- A. Developed structure and property relationship of flexible open-cell foams.
- B. Developed techniques to measure the glass transition temperature of the Carilite wood adhesive cured in plywood.
- C. Developed techniques to characterize the mechanical properties of Cariverse polymer in a tiny quantity (a few grams).
- C. Established a procedure to measure the molecular chain orientation of drawn polymer fibers by X-ray diffraction.

Short Courses

1. "NACE Cathodic Protection - Level 3", March 2001
2. "Coating Science for Coatings Formulators", Univ. of Southern Mississippi, June 2000
3. "Acid-Base Interaction: Relevance to Adhesion" K. L. Mittal, June, 1999
4. "Water-Soluble / Water - Borne Polymers", Univ. of Southern Mississippi, Feb. 1998
5. "Internal Coatings: Why, Which and How" NACE TechEdge, April 1998
6. "Coating Adhesion", Kent State Univ, May 1998
7. "Corrosion and Its Control by Protective Coatings", Lehigh Univ., May 1997
8. "Using Fusion Bonded Powder Coating in the Pipeline Industry", NACE TechEdge, June, 1997
9. "NACE Protection Coating and Linings", 1996
10. "Introduction to Paint Formulation", Univ. of Missouri-Rolla, 1996
11. "Coating Film Formation", ACS, 1995
12. "NACE Coating Inspection Certification 1", Oct. 2001
13. "NACE Coating Inspection Certification 2", Dec. 2001
14. "NACE Coating Inspection Certification 3 & Peer Reviews", Feb. 2002

External Publications

1. "Selection of Field Applied Liquid Rehabilitation Pipeline Coatings" Benjamin T. A. Chang, Howard R. Mitschke, and Paul R. Nichols, Paper # 01609 Symposium 01-T-10D, NACE 2001 Conference, Houston, TX
2. "Crystal Orientation Function of Poly(trimethylene terephthalate) by Wide-angle X-ray Diffraction" Hoe H. Chuah (), Benjamin T.A. Chang, Polymer Bulletin 46 (2001) 307
3. "Low Cost Offshore Platform Maintenance Coatings In The Gulf of Mexico", Benjamin T. A. Chang, Jon D. Unwin, SSPC Annual Conference, Nashville, TN, 2000
4. "Evaluation of Offshore Platform Maintenance coatings in Gulf of Mexico" B. T. A. Chang, C. A. Guy, Proceedings of SSPC 99 Conference. Houston, Texas, Nov. 1999
5. "Performance of Flexible Epoxy Coatings for Offshore / Marine Applications" D. J. Weinmann, B. T. A. Chang, Proceedings of SSPC 99 Conference. Houston, Texas, Nov. 1999
6. "Collapse Resistance of Cured-In-Place Pipes" K. H. Lo, B. T. A.

- Chang, Q. Zhang, W. J. Wright, North American Society for Trenchless Technology No-Dig '93 Conference, May 2-5, 1993, Session E
7. "Tensile Creep of Cured In Place Pipe Materials In simulated Field Environments" B. T. A. Chang, K. H. Lo, G. D. Edwards, Insituform Process Technical Conference, Sept. 6-11, 1992, Oslo, Norway
 8. "Creep Rupture Life Prediction of EPON Resin-Felt Composite Laminates Used in The Insituform Process" B. T. A. Chang, K. H. Lo, 1991 Annual European Insituform Technical Meeting, Sept. 30 - Oct. 4, 1991, Houston, Texas
 9. "Failure Analysis of FRP Springs" B. T. A. Chang, K. H. Lo, 43rd Annual Conference of SPI, Feb 1-5, 1988, Session 10-D
 10. "New Non-MDA Epoxy Resin systems for Resin Transfer Molding (RTM) and Filament Winding" E. B. Stark, L. M. Schlaudt, B. T. A. Chang and W. V. Breitigam, 32nd International SAMPE Symposium April 16-9, 1987, P1092
 11. "Recovery of Compressive Strain in Atactic Polystyrene" B. T. A. Chang, J.C. M. Li, J. Mat. Sci. 16 (1981) 889
 12. "Anelastic Strain Recovery of Atactic Polystyrene" B. T. A. Chang, J. C. M. Li, Bulletin of the American Physical Society 25 (1980) 252
 13. "Stored Enthalpy and Its Release in Atactic Polystyrene" B. T. A. Chang, J. C. M. Li, Bulletin of the American Physical Society 25(1980)252
 14. "Indentation Recovery of Atactic Polystyrene" B. T. A. Chang, J. C. M. Li, J. Mat. Sci. 15 (1980) 1364
 15. "The Angle of Intersection of Coarse Shear Bands in Polystyrene" B. T. A. Chang, J. C. M. Li, J. Mat. Sci. 14 (1979) 1500
 16. "Indentation Recovery of Amorphous Materials" B. T. A. Chang, J. C. M. Li, Scripta Met. 13 (1979) 51

Memberships

NACE, SSPC, ASTM, Federation of Coating Societies

Patent

"Form Filter Material and Process to Prepare Foam Filter Material"

Patent #

6,103,645, Aug 2000