



## Simonida Grubjesic, Ph.D.

### Laboratory Manager & Sr. Consultant

Simonida Grubjesic is consultant with Materials Technology Group. Her responsibilities include technical consulting and materials laboratory testing. Dr. Grubjesic's professional practice focuses on forensic failure investigation of organic and polymers materials, paints and coatings, smart new technologies, and solving materials related challenges for clients coming from diverse markets.

Dr. Grubjesic's extensive industry experience includes laboratory management, new product research and development, materials synthesis and characterization with applications in multiple industries including construction, paints and coatings, sealants and adhesives, nanotechnology and biomedical devices. Her specialty lies in the analysis of organic and polymeric coatings, materials characterization, surface and corrosion science. Dr. Grubjesic brings a strong proficiency in paint and coatings, sealants and adhesives failure analysis using characterization techniques such as FTIR in combination with variety of other materials testing techniques.

Prior to joining CTLGroup, Dr. Grubjesic worked at a major chemical additive manufacturing firm where she was part of the Research & Development department leading multiple projects involving development of organic and inorganic pigment additives for industrial and architectural paints and coatings market. She has past experience with raw materials production, process optimization and troubleshooting as well as regulatory and commercial aspects of raw material manufacturing.

Dr. Grubjesic has spent number of years in governmental research facility designing and studying smart polymeric functional materials with emergent behaviors to solve energy conversion and storage challenges as directed by US Department of Energy. She has also worked on broad range of topics including nanotechnology and functional materials. Dr. Grubjesic's technical background extends to biomaterials with a specialty in medical device coatings. Her experience also includes development of bioadhesives.

Dr. Grubjesic has a Ph.D. in Organic Chemistry and has taught organic and general chemistry courses and has served as a peer reviewer for academic journals and industry publications.

### Academic Credentials

Ph.D. Organic Chemistry  
University of Illinois at Chicago,  
2004

B.S. in Chemistry  
University of Novi Sad-Serbia,  
1997

### Professional Affiliations

ASTM International  
American Chemical Society (ACS)  
Society for Protective Coatings  
(SSPC)  
American Concrete Institute  
(ACI)  
Chicago Society for Coatings  
Technology (CSCT)

### Contact Information

5400 Old Orchard Road  
Skokie, Illinois 60077  
(847) 972-3176  
SGrubjesic@CTLGroup.com

### Representative Project Experience

#### Paints + Coatings Investigation

- Technical Expert in charge of investigating construction defects related to paint failure on aluminum railings at a high-rise condominium building in metropolitan area. Observations and sample collection of flaking/delaminated paint were made at various units in the building, which were brought to CTLGroup for material testing to ascertain the cause of the paint failure.
- Technical Expert responsible for testing and identifying the causes for observed corrosion of reinforcing steel bars and railing along balconies of a condominium building, as well as the delamination, spalling, and cracking of post pocket grout and balcony concrete surrounding the aluminum railing.
- As the Technical Expert, Dr. Grubjesic was responsible for conducting chemical testing on observed corrosion of aluminum cladding materials and railings along balconies of a condominium building. A combination of Microscopy, X-ray, and Fourier Transform Infrared Analyses was conducted to determine the cause of corrosion.
- Dr. Grubjesic was in charge of investigating the paint cracking observed on the outside concrete benches located in California. Paint and concrete samples were sent to CTLGroup for material testing to determine the cause of the paint failure. Material

evaluation using Microscopy and Fourier Transform Infrared Analyses was performed during the investigation.

- As the Technical Expert, Dr. Grubjesic was in charge of investigating the premature failure of a multi component traffic membrane located in Canada. The Fourier Transform Infrared Analyses was conducted to determine the possible cause of membrane failure.

#### **Materials Failure Investigation**

- Dr. Grubjesic was the Technical Expert responsible for evaluating samples from a residential concrete foundation where cracking was observed. The concrete mix design and cored samples condition was examined using chemical and petrographic techniques to determine the source of the concrete foundation cracking.
- Dr. Grubjesic was the Technical Expert responsible for determining the type and amount of polymer content in mortar used to attach a stone veneer to the outside facade of an educational facility, which was displaying deterioration. Standard materials characterization techniques like Fourier Transform Infrared Analyses and Thermogravimetric Analysis were utilized in this forensic investigation.
- Chemical and microscopic evaluation of the grout employed in an ongoing repair and maintenance of a strategic Dam in Middle East was conducted by CTLGroup. Dr. Grubjesic was the Technical Expert responsible for performing chemical analyses and extraction of organic components present in grout in order to assess the bulk chemistry of the grout in combination with X-ray studies and pH determination to determine carbonation and relative ages of grout samples collected from the dam.

#### **Litigation + Consulting**

- Dr. Grubjesic was the Technical Expert for a raw material manufacturer in food and supplements industry evaluating the materials testing reports and manufacturer's certificate of analysis documentation to support the client's dispute over the alleged compromised edible oil-based product quality upon storage.
- Dr. Grubjesic provided consulting services in the evaluation of the source, nature and environmental hazards of the organic materials spill discovered at the construction site.
- Dr. Grubjesic provided testing and consulting services for a US based client that had to change tall manufacturer for an organic chemical raw material. The client's analytical laboratory did not support the type of testing needed to qualify the new production source. Dr. Grubjesic designed a new testing protocol to aid the clients QA efforts.

#### **Publications**

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Tiu, B.D.B.; Grubjesic, S. et al. Improved Corrosion Protection Due to Organic Corrosion Inhibitors in Waterborne Paint Coatings, *J. Coatings Tech*, August 2016.

Grubjesic, S.; Tarjan, D.; Toussaint, A. Zinc-free Protection in Waterborne Coatings, *Welt der Farben*, 2016.

Grubjesic, S.; Lee, B.; Seifert, S.; Firestone, M.A. Preparation of self-supporting cell architecture mimic by water channel confined photocrosslinking within a lamellar structural hydrogel. *Soft Matter*, 7, 9695-9705, 2011.

Edelstein, A.; Fink, D.; Musch, M.; Valuckaite, V.; Zaborina, O.; Grubjesic, S.; Firestone M. A.; Matthews, J. B.; John, C.; Alverdy, J. A. Protective effects of nonionic tri-block copolymers on bile acid mediated epithelial barrier disruption, *Shock*, 36, 451-457, 2011.

Grubjesic, S.; Firestone, M.A. Cytoskeleton-mimetic reinforcement of self-assembled N,N'-diallylimidazolium ionic liquid monomer by copolymerization. *Macromolecules*, 42, No.15, 5461-5470, 2009.

Green, O.; Grubjesic S.; Lee, S.; Firestone, M.A. The Design of Polymeric Ionic Liquids for the Preparation of Functional Materials, *Polymer Reviews*, 49, 339–360, 2009.

Moriarty, R.M.; Grubjesic, S.; Surve, B. C; Chandrasekera, S.N.; Prakash, O.: Naithani, R. Synthesis of Abyssinone II and related compounds as potential chemopreventive agents. *European Journal of Medicinal Chemistry*, 41, 263-267, 2006.

Grubjesic, S.; Dalsin, J.L.; Fang, F.; Szleifer, I.; Messersmith, P.B. Adsorption of non-fouling polymers functionalized with mussel adhesive protein mimetic peptides: computational predictions and experimental observations. *Polymer Preprints*, 46, No.1, 116-117, 2005.

Li, Y.; Grubjesic, S.; Nikolic, D.; Kosmeder, J. W. Moriarty, R.M.; Pezzuto, J. M.; van Breemen, R.B. In vitro assessment of intestinal permeability and hepatic metabolism of 4'-bromoflavone, a promising cancer chemopreventive agent. *Xenobiotica*, 34, No. 6, 535-47, 2004.

Nikolic, D.; Li, Y.; Chadwick, L. R.; Grubjesic, S.; Schwab, P.; Metz, P.; van Breemen, R. B. Metabolism of 8-prenylnaringenin, a potent phytoestrogen from hops (*Humulus lupulus*), by human liver microsomes. *Drug Metabolism and Disposition*, 32, 272-279, 2004.

Grubjesic, S.; Moriarty, R. M.; Pezzuto, J. M. Aromatase inhibitors. *Expert Opinion on Therapeutic Patents*, 12, 1647-1661, 2002. Review

#### **Books**

Pezzuto, J.M.; Kosmeder II, J.W.; Park, E.J.; Lee, S.K.; Cuendet, M.; Gills, J.; Bhat, K.; Grubjesic, S.; Park, H.-S.; Mata-Greenwood, E.; Tan, Y.M.; Yu, R., Lantvit, D.D.; Kinghorn, A.D. Characterization of natural product chemopreventive agents. *Cancer Chemoprevention*, 3-37, 2005.

#### **Presentations**

Grubjesic, S. Materials Testing Used in Coatings Failure Investigations, CP 2018 Industry Technical Seminar, Minnetonka, Minnesota, 2018.

Grubjesic, S. Analytical Laboratory Techniques Used in Coatings Investigations, CP 2018 Industry Technical Seminar, Elk Grove, Illinois 2017.

Grubjesic, S. Inorganic and Organic Corrosion Inhibitors for High Performance Coatings, CH Erbsloh Coatings Conference, Moscow, Russia, 2016.

Grubjesic, S. Striving for Optimal Corrosion Resistance in Waterborne Paint Systems. Western Coatings Show, Las Vegas, NV, 2015.

Grubjesic, S., Firestone, M.A. Polymeric Nanostructured Hydrogels as Biomembrane Patches, 280-2, Pittcon, Chicago, IL, 2009.

Grubjesic, S., Firestone, M.A. Ionic Liquid-Derived Nanostructured Polymers As Membrane Protein Scaffolds, Postdoctoral Research Symposium, Argonne National Laboratory, Argonne, IL, 2008.

Grubjesic, S.; Dalsin, J. L.; Messersmith, P. B. Synthesis of catecholic amphiphiles for TiO<sub>2</sub> surface modification. 231st ACS National Meeting, Atlanta, GA, 2006.

Fan, X.; Sherman, D.; Grubjesic, S.; Lee, H.; Messersmith, P. Block Copolymer Brush-Ag Hybrid Thin Films by Surface-Initiated Polymerization for Antimicrobial and Antifouling Surfaces, MRS Spring Meeting, San Francisco, CA, 2006.

Grubjesic, S.; Dalsin, J. L.; Fang, F.; Szleifer, I.; Messersmith, P. B. Adsorption of non-fouling polymers functionalized with mussel adhesive protein mimetic peptides: computational

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predictions and experimental observations. POLY-233, 229th ACS National Meeting, San Diego, CA, 2005.

Grubjesic, S.; Li, Y.; Kosmeder, J. W.; van Breemen, R. B.; Pezzuto, J. M.; Moriarty, R. M. Synthesis and structure verification of 4'-bromoflavone metabolites. MEDI 355, 226th ACS National Meeting, New York, NY, 2003.

Grubjesic, S.; Park, H.; Kosmeder, J. W.; Pezzuto, J. M.; Moriarty, R. M. Synthesis of prenylated flavonoids and their activity in aromatase assay. MEDI 107, 225th ACS National Meeting, New Orleans, LA, 2003.

### **Prior Experience**

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ICL\Advanced Additives/ICL Performance Products, Hammond, Indiana  
Research Specialist, R&D/Marketing and Technical Services Department, 2014 - 2017

Benedictine University, Lisle, Illinois  
Lecturer-Organic Chemistry, 2014

Argonne National Laboratory, Lemont, Illinois  
Research Chemist, Materials Science Division, 2009 - 2013  
Post-Doctoral Fellow, Materials Science Division, 2007 - 2009

Northwestern University, Evanston, Illinois  
Post-Doctoral Fellow, Biomedical Engineering, Biomaterials Group, 2004 - 2007

University of Illinois at Chicago, Chicago, Illinois  
Research Assistant, Chemistry Department, 1999 - 2004  
Intern, Chemistry Department, summer 1996