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Andres Diaz-Cano

Education

Purdue University, West Lafayette, Indiana
Doctors of Philosophy, Materials Science and Engineering Expected May 2017
Ph. D. Candidate
American ceramic society member; 2015-present

National University of Colombia, Medellin, Colombia.
Bachelors of Science, Mechanical Engineering August 2012

Skills & Techniques

- Windows, Ubuntu, Chrome OS's
- Microsoft office - Word, Excel, PowerPoint, Outlook
- OriginLab - Data analysis
- ImageJ - Image processing and analysis
- OM & SEM - Optical and scanning electron microscopy
- Photography – Adobe Lightroom, Photoshop
- TGA - Thermogravimetric analysis.
- XRD - Xray diffraction.
- BET specific surface area measurement.
- Rheology and viscometry.
- High temperature vacuum furnace maintenance and operation.
- Dilatometry
- CAD design & machining – Autocad, SolidWorks, SolidEdge.
- Attrition and Ball Milling
- Mechanical characterization - Tensile, hardness & tribological tests.
- Metallographic characterization – Grinding, polishing, etching.
- 3D printing-Additive manufacturing – UV cured resin (Formlabs) & filament direct writing.

Research experience

- ✓ **Purdue University,** West Lafayette, IN, US. Aug.2013- Feb.2017
  Graduate research assistant:
  Advisors: Dr. Jeffrey Youngblood & Dr. Rodney Trice.
  Development of water based ceramic suspension gels for room-temperature injection molding of boron carbide. U.S Army Research Office. Grant # W911Nf-13-1-0425

- ✓ **Colombia National University**, Medellin, Ant. Colombia. Aug. 2009 – Aug. 2011
  Undergraduate research assistant.
  Tribology and Surfaces group.
  Advisors: Dr. Alejandro Toro & Dr. Diana Lopez
  "High temperatures erosive wear in thermal barrier coatings (TBC's) systems"
  Microstructural characterization & cycling thermal tests
  Department of Science, Technology and innovations; Colciencias – Grant #111845421942

Work experience

✓ **Re-design and improvement** ASTM G65 abrasion test machine.
School of Mines, National University of Colombia. Medellin Feb. – March 2013

✓ **Materials consultant & Design engineer** - Kobaltum S.A.S; Medellin:

- Industrial fan shaft failure analysis. Feb. 2013
- Hydroelectric plant desander system analysis. Sept. – Oct. 2012
- Bearing housing characterization. March – April 2012
- Mud pump shaft failure analysis; Jan. – Feb. 2012

✓ **Industrial consultant** as undergraduate research assistant in:

- Liquefied petroleum gas burners failure analysis
- Transport belt shaft failure analysis.
- Hard-facing coatings wear characterization.
- Black Hawk helicopter - drag beam failure analysis.
- Bearing housing abrasive wear analysis.
- Automobile component failure analysis.
- Petroleum pipes coating wear characterization.

School of Mines, National University of Colombia. Medellin Aug. 2009 – Nov. 2011

Publications & Patents

✓ **Diaz-Cano A.**, Youngblood J., Trice R., **(2016)**
"*Stabilization of highly loaded boron carbide suspension gels*" In preparation.

✓ W. Costakis, L. Rueschhoff; **A. Diaz-Cano**; J. Youngblood, PhD; R. Trice, PhD **(2016)**
"Additive Manufacturing of Boron Carbide via Continuous Filament Direct Ink Writing of Aqueous Ceramic Suspensions". Submitted ceramics international

✓ Wiesner V., Rueschhoff L., **Diaz-Cano A.**, Trice R., Youngblood J. **(2015)**
"Producing Dense Zirconium Diboride Components by Room-Temperature injection Molding of Aqueous Ceramic Suspensions" Ceramics International 42 (2), 2750-2760

✓ **A. Diaz-Cano**, L. Tobon, **(2013)**
"Efectos de las cargas térmicas variables en los sistemas de Barrera Térmica" (Effects of variable thermal loads in Thermal Barrier Coatings)
CINTEX. Vol. 18, pp. 283-296. 2013.

✓ Youngblood, J., Trice, R., Wiesner V., Rueschhoff L., **Diaz-Cano A**., **(2015)**
"Injection Molding of Aqueous Suspensions of High--temperature Ceramics"
US Patent Application 62/184,292, filed 6/2015. Patent Pending.

Leadership and teaching experience

- ✓ **Vice-President** - Colombian student association at Purdue - CSAP.
  2015–2016; Purdue University

  Organizer of:
  - Academic event *"Progreso: Research contributions from Latinamerica"* Spotlight: Colombia
  - Cultural Event "Hecho en Colombia"
  - Latin Night at Lafayette brewing Co.
  - CSAP Purdue Day of Giving 2015
  - CSAP Summer Super Series Jun.2015
  - Online workshops Proyecto Interchange
  - Monthly academic CSAP presentations
  - Banners & Souvenirs designs.
  - Room reservations & food logistics
  - Photographic records

- ✓ **Mentoring:**
  - Ivan Zuluaga – Masters Internship - Materials science and processing.
    National University of Colombia. Fall 2014.
    Master Thesis: *"Synthesis and characterization of ceramic powders for thermal barriers coatings systems"*

  - William Costakis – Bachelor Student - Material science and Engineering.
    Purdue University. Spring 2015
    Robocasting Optimization of ceramics suspension gels of boron carbide

  - Ross Piedmonte – Bachelor Student - Material science and Engineering.
    Purdue University. Fall 2015. Spring 2016
    Characterization of boron carbide and sintering aids analysis.

- ✓ **Teaching assistant** - "Structure and Properties of Materials".
  Spring 2014; Purdue University
  Responsible for: twice a week 50 min. recitations. Assignments grading, quizzes design & grading, and office hours twice a week for 65 students.

- ✓ **Teaching assistant** - "Computer Aid Drawing". AUTOCAD.
  Aug.-Nov. 2008; Feb.-May 2009. National University of Colombia
  Responsible for: Once a week 2 hr. lecture assistant and weekly office hours for 40 students.

Languages

Spanish	English	German
Native	**FLUENT** **93**/120 TOELF iBT Dec. 2012	**BASIC** **B2** - Zertifikat Deutsch Ausreichend. 210/300 Nov. 2011

Complementary studies

- ✓ Graduate masters courses:
  - Tribology fundamentals. Spring 2010.
  - Scanning electron microscopy. Spring 2010.
  - Advanced materials science. Fall 2011.

  Mines School
  National University of Colombia.

- ✓ *"Size dependence of graphene´s mechanical properties"*
  College of engineering
  University of North Carolina, Charlotte, NC, USA
  July-Aug. 2012.
  Advisor: Dr. Alireza Tabarraei

Conferences & Seminars

- ✓ **Diaz-Cano A.**; Youngblood J.; Trice R
  "*Optimization of water based boron carbide suspension gels*" – Oral presentation.
  40th International Conference and Exposition on Advanced Ceramics and Composites - ICACC
  Daytona Beach, FL, USA. Jan. 2016.

- ✓ **Diaz-Cano A.**; Youngblood J.; Trice R
  "*Room Temperature Injection Molding of Water-Based Boron Carbide Suspensions*"
  Oral presentation
  Material Science & Technology Conference and Exhibition – MS&T
  Columbus, OH, USA. Oct. 2015.

- ✓ **Diaz-Cano A.**; Youngblood J.; Trice R
  "*Optimization of water based boron carbide suspension gels for room-temperature injection molding to produce complex-shaped armor components*" – Oral presentation
  39th International Conference and Exposition on Advanced Ceramics and Composites - ICACC
  Daytona Beach, FL, USA. Jan. 2015.

- ✓ ACerS Winter Workshop – American Ceramic Society.
  University of Central Florida, Orlando, FL, USA. Jan. 2016.

- ✓ II International Engineering Lectures Series – Applied Tribology.
  National University of Colombia, School of Mines,
  Medellin. Col – July 2008.

- ✓ Software Tools uses certificate: Solid Edge.
  Colombian national learning system. SENA-virtual
  Aug. 2007

West Lafayette, IN, USA. March 2016