May 14, 2013– ASM Trustee Visit

Topic: Engineered Coatings Using Pack Cementation Processes

Speaker: Dr. Vilupanur Ravi, FASM
ASM Trustee (2010 - 2013)
Professor and Chair
Chemical & Materials Engineering Department, Cal Poly Pomona
(www.csupomona.edu)

Directions: The Adams Mill, 165 Adams Street, Manchester, CT 06042, Ph: 860-646-4039 (www.theadamsmill.com/directions.htm)
I 84 Take exit 62, from west turn right onto Buckland Street, continue straight for less than a mile (Buckland Street turns into Adams Street by the Manchester Honda Dealership). From east turn right at end of exit and right at light onto Buckland and follow directions above. The restaurant is on the left, a brick building set back off the road.

Program Charges:
- Cocktails: 5:30-6:30 PM Regular Members - $28
- Dinner: 6:30-7:30 PM Young Professionals - $20
- Program: 7:30-8:30 PM Retirees - $15
- Full Time Students - $15

Entrées must be pre-ordered
- Chicken Adams
- Roast Prime Rib of Beef
- Fresh Oven Roasted Salmon Fillet
- Vegetarian

Technical Chairperson: Sam Christy
Reservations: Call Joe at 860-573-0313 or joe.kubinski@yahoo.com by noon May 9th.

Thanks!

Abstract:

Metallic surfaces can be altered to achieve design objectives, e.g., corrosion resistance, wear or abrasion resistance, etc., using a wide range of coating methods. The particular method chosen is usually the result of the interplay of many factors including economics and design requirements. The focus of this talk will be on the development of coatings using Halide Activated Pack Cementation (HAPC). HAPC is a versatile and economical approach to apply coatings of desired compositions to a range of substrates, typically nickel and iron-based alloys. The coating process can be controlled to obtain the desired final composition and microstructure.

The in situ generation of halide vapor species inside the pack with subsequent transport, surface reactions and solid state diffusion are important phenomena that need to be understood in order to achieve optimal coating conditions. In this talk, I will review the halide-activated pack cementation process; discuss relevant thermodynamics and kinetics; and present the current status of our work. Specific examples, e.g. coatings on nickel, superhard coatings, etc., will be presented.

Bio:

Dr. Ravi is professor in the Chemical and Materials Engineering Dept. at California State Polytechnic University, Pomona (Cal Poly Pomona), and also the coordinator for the Materials Engineering Minor program at Cal Poly Pomona. Professor Ravi received his B.Sc. in physics (First Class) from the University of Madras in 1980, his B.E. in metallurgy (with distinction) from the Indian Institute of Science in 1983, and his M.S. and Ph.D. in metallurgical engineering from Ohio State University, Columbus, in 1986 and 1988, respectively.

Dr. Ravi was a member of the technical staff at Lanxide Corp. from 1988-1994, where he worked on the development of ceramic and metal matrix composites and high temperature coatings. His contributions to this area resulted in several U.S. and international patents. Dr. Ravi subsequently worked at W.L. Gore and Associates Inc. from 1994-2000, where he led several global programs in fundamental studies of expanded polytetrafluoroethylene (PTFE) for the company. He also formed and led a global effort within the company on characterization of PTFE and derived products. His work resulted in characterization tools that continue to have significant impact on manufacturing practices and product performance.

Dr. Ravi has been deeply involved with various groups and community outreach activities to bring awareness of science to students K-12 that might lead to consideration of materials science and engineering as a career path. He has been actively involved with ASM committees including Education, the Editorial Committees of Advanced Materials & Processes and Journal of Materials Engineering and Performance, and MS&T Organizing Committee. He also has been active in several ASM Chapters including Brandywine Valley, Los Angeles, and has served as faculty advisor, Materials Advantage Chapter of Cal Poly Pomona (formerly Student Chapter of ASM) from 2004 to present.

Among his many honors and awards are Fellow of the Institute of Materials, Minerals, and Mining (UK), Honorary Member of Pi Tau Sigma, NASA Faculty Fellow, NRC Summer Faculty Fellow, Eminent Engineer of Tau Beta Pi, Honorary Member of Alpha Sigma Mu, Life Member of the Indian Institute of Metals, Honorary Research Fellow of School of Engineering, Univ. of Exeter (UK), and Fellow of ASM International.