

# 3<sup>rd</sup> International Conference and Exhibition on Materials Science & Engineering

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## *Rodrigo V Devivar*

Jacobs Technology-NASA Johnson Space Center, USA

### **Precise heat control- Essential materials characterization techniques everyone needs to solve real problems**

The performance of a material is greatly influenced by its thermal and chemical properties. At NASA, we depend on precise thermal analysis instrumentation to understand and predict the performance of materials during aerospace travel. Analytical thermochemical techniques allow us to test materials in the laboratory prior to an actual field test; whether the field test is miles up in the sky or miles underground, the properties of any involved material must be fully studied and understood in the laboratory. Almost any engineered system in operation can fail in some way and, during a failure investigation, analytical techniques become indispensable for identifying the chemical basis of a material failure. The essential techniques for materials characterization are derived from the thermal and chemical properties of the material itself and can be measured with various laboratory instruments including FT-IR, GC-MS, Pyrolysis, Differential Scanning Calorimetry (DSC) and Thermogravimetric Analysis (TGA). Some hyphenated analytical techniques, such as TGA-MS and Pyrolysis-GC-MS become extremely powerful for solving real problems faced by the aerospace industry. The correlation of these destructive and non-destructive techniques will highlight the importance of each in solving the puzzle of materials characterization and ultimately the mode of material failure.

### **Biography**

Rodrigo V Devivar earned his Bachelor's degree from the University of California, Berkeley and his PhD from the University of Michigan in Ann Arbor. He has a wealth of experience in the biotechnology sector, from post-doctoral associate all the way up to laboratory director, but has returned to the scientific sector and has been at NASA since 2001. He is currently a Senior Scientist in the Materials Evaluation Laboratory at the Johnson Space Center, where he is always challenged with issues faced by the aerospace industry.

[rodrigo.v.devivar@nasa.gov](mailto:rodrigo.v.devivar@nasa.gov)