

# Oral Presentations

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## Characterization of nanomaterials with low voltage field emission scanning electron microscopy: Promises and challenges

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### **Abstract**

Use of materials in the form of thin films, layers, coating, nanowires, nanotubes, and nanoparticles is increasingly deployed in many industries. Application varies from semiconductors to memory or optical devices, to catalysis, corrosion, as well as many artistic, chemical, electronic and biomedical fields. In this communication, I report on two years of consulting research work at Agilent Technologies Inc., using the Agilent 8500 Field Emission Low Voltage Scanning Electron Microscope. This scope allows imaging of most types of materials: metals & alloys, minerals & rock, ceramics, semiconductors, polymers, and biological samples, as well as micro- and nano-devices (PV-cell, MEMS, AFM-cantilever, dynamic memory, etc.). It provides images of 5-10nm resolution without the need for sample coating (usually done with Au, C, or Au-Pd in conventional SEMs). The imaging is done at a standard accelerating voltage (AV) of 1000v instead of the conventional voltage of 15-35kV. This low voltage avoids analyst also the charging effects and the radiation damage that may result with insulating specimens from the higher AC or the damage to biological specimens when imaged with and an Environmental Cell Scanning Electron microscope (E-SEM). Data to be presented concern a

wide range of materials and address multiple questions on the nature, structure, and application/occurrence of these materials in different contexts (engineering, geological, archaeological or artistic). Major focus shall be given to materials at the nanoscale level.