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Strategies for the effective integration of reference data and reference materials

NIST scientists are responsible for providing critical advancements in measurement science to address the nation's needs for reliable and accurate metrology and traceability, transferring new measurement technology to the U.S. and international customers. In support of this mission, NIST provides a wide variety of measurement services encompassing three important programs: Calibrations, Standard Reference Materials® (SRMs), and Standard Reference Data (SRD). The SRMs program at NIST includes over 1, 300 artifacts traceable to national standards suitable for in situ self-calibration and methods validation, while the SRD program includes a diverse amount of data archived and critically evaluated that is widely disseminated in printed and/or electronic media.

Given the ever-increasing demand for data and information in the physical, chemical, biological and materials sciences, a new paradigm-shift involving the seamless integration of reference materials and reference data seems to be the logical way forward for information providers and metrology laboratories. To achieve this, novel dissemination models and data information tools must be implemented, where databases and data analysis tools, covering a wide variety of physical and chemical properties of particular SRMs could be made available to scientists and engineers. At the end, entire scientific communities supporting particular reference materials will be created making the metrology laboratories supporting these activities of scientific information brokers rather than just data providers. In this talk, issues related to the effective integration of reference data with reference materials will be discussed. In particular, challenges associated with the capture, archiving, curation, validation, analysis, and dissemination of the data will be addressed.

Biography

Carlos A Gonzalez received his PhD in Theoretical Chemistry at Wayne State University, in 1990. He then moved to Pittsburgh in 1991 where he worked as a Postdoctoral Associate in Carnegie Mellon University (CMU) under the supervision of Prof. John A Pople, Nobel Laureate in Chemistry, 1998. He joined the Chemical Sciences and Technology Laboratory at NIST in 1997 as a Research Chemist after spending 5 years as a Research Specialist at the Pittsburgh Supercomputing Center, CMU. He is currently the Chief of the Chemical Sciences Division at NIST. He has published over 100 papers in the area of quantum chemistry.

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