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presenting  
Surface and Interfacial Properties in Advanced Ceramic and Inorganic Materials

Nanoparticles and nanocomposites provide advantages in function when they replace traditional ceramics due to their high surface and interfacial areas that react with the surrounding environment. To further advance technologies and devices, the structure of such new materials must be well understood to predict and determine properties that need to be enhanced or suppressed. Nuclear magnetic resonance (NMR) spectroscopy has the ability to study the molecular structure of nanoscale materials to allow the surfaces and interfaces to be studied. The local molecular structures can be correlated to one another to identify intermolecular interactions that occur on surfaces and interfaces. This talk will focus on structural investigations of crystalline dicalcium silicate nanoparticles and amorphous polymer-derived ceramic nanocomposites. The surfaces and interfaces in these materials are given particular attention to identify the structural features and mechanisms that control the important technological properties.