

Degradation Processes in Nanostructured Materials

As more advanced materials find their way into daily life, a better understanding of degradation processes is required, allowing us to more accurately predict their lifetime and further increase their performance, reliability. While degradation processes are initiated at molecular (subnanometer) scale, the nanostructure and nanoconfinement of materials alter the degradation processes occurring in materials at micron or larger scales, and eventually trigger new degradation routes. This book studies the effect of nanometer-scale structure and confinement on degradation processes and analyzes the experimental and theoretical approaches used to estimate the lifetime of nanostructured and nanoconfined materials in various environments. Various topics are addressed - from electronic, optical, structural, and magnetic nanomaterials to space, chemical, biological and medical applications. There is also an emphasis on the time dependence associated with artificial treatments involving electrical currents, annealing, and irradiation by various sources, such as gamma radiation and ions.



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