This book joins and integrates ceramics and ceramic-based materials in various sectors of technology. A major imperative is to extract scientific information on joining and integration response of real, as well as model, material systems currently in a developmental stage.

This book envisions integration in its broadest sense as a fundamental enabling technology at multiple length scales that span the macro, millimeter, micrometer and nanometer ranges. Consequently, the book addresses integration issues in such diverse areas as space power and propulsion, thermoelectric power generation, solar energy, micro-electro-mechanical systems (MEMS), solid oxide fuel cells (SOFC), multi-chip modules, prosthetic devices, and implanted biosensors and stimulators. The engineering challenge of designing and manufacturing complex structural, functional, and smart components and devices for the above applications from smaller, geometrically simpler units requires innovative development of new integration technology and skillful adaptation of existing technology.

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