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Preface

There continues to be tremendous interest in the use of chemical processing routes to glasses and ceramics. In principle, chemical processing of glasses and ceramics provides access to atomic mixing which in turn reduces the energy requirements to produce a given phase. Phase control includes the potential to generate metastable (kinetic) phases. Atomic mixing may also provide access to controlled microstructures. Microstructural control extends from processing dense, nano- or microcrystalline structures to highly porous materials with well-defined pore sizes. In addition, the opportunity to start with highly purified chemicals, in principle, provides access to high purity glasses and ceramics for electronic and optical applications. Finally, chemical processing may provide access to shapes (e.g. films, membranes, or fibers) that are not easily obtained by traditional melt processing or solid state reaction methods of producing glasses and ceramics.

Despite this considerable motivation for exploring the use of chemical processing routes, numerous synthetic and processing pitfalls await a new entrant to this field. This special issue, the second of its type, was organized with the idea of providing the reader with examples of work done at both ends of the chemical routes spectrum, synthesis and processing. The following papers illustrate the utility and problems associated with this very important, and growing, method of producing glasses and ceramics.

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