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Liquid Metals: From Fundamentals to Applications

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Message from the Guest Editors

Dear Colleagues,

Metal and alloy liquids at or near room temperature have intrigued humankind for centuries. Recently, mercury was phased out in ample applications due to its toxicity and safety concerns. In lieu of mercury, gallium-based liquid metals have garnered renewed attention by the scientific community due to their safety and a combination of advantageous thermophysical properties. Further interesting alloys are based on indium (i.e., Field's metal) and alkali metals.

In particular, gallium-based alloys have been exploited for various applications, ranging from chemical (micro-)reactors and reaction environments (i.e., for galvanic replacement reactions and generation of thin metal oxides) via drug carriers to flexible electronics and thermal interface materials. The application of these alloys requires a fundamental understanding of liquid metals and their behavior (i.e., wetting, adhesion, alloying/corrosion/reactivity, viscosity, melting temperature and so on). Further, it necessitates detailed knowledge on the means to manipulate its properties and shape/location, i.e., for patterning techniques, and to limit liquid metal corrosion/embrittlement.

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Message from the Editor-in-Chief

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