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Cover Picture
K.-H. Li et al. In situ scattering study of multiscale structural evolution during liquid–liquid phase transition in Mg-based metallic glasses

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Cover story

(Kang-Hua Li, Jia-Cheng Ge, Si-Nan Liu, Shu Fu, Zi-Xuan Yin, Wen-Tao Zhang, Guo-Xing Chen, Shao-Chong Wei* , Hua Ji, Tao Feng, Qi Liu* , Xun-Li Wang, Xiao-Bing Zuo, Yang Ren, Horst Hahn, Si Lan*,pp. 3107–3116)

Manipulating structure and properties of Mg-based liquid metals based on liquid-liquid phase transition

Mg-based metallic glasses, i.e., liquid metals, as high-strength light alloys combined with excellent corrosion resistance, have been broadly applied in the hydrogen storage and biomedical fields. In this issue, a liquid-liquid phase transition was found to occur in Mg-based liquid metals of an anomalous exothermic peak. The multiscale structures, including medium-range ordered structures and nanoscale heterogeneities, could be tuned by control of the phase transition kinetics. The mechanical properties, electronic properties, and corrosion resistance may be tunable using the revealed structure-properties relation. The robot's left hand is soft and liquid-like, and the mimicking sword of the right hand indicates the high hardness of the strengthening metals after phase transition. The calorimetric curve with an anomalous exothermic peak linking schematic structure models underneath both hands suggests that the structure and properties of the Mg-based alloys could be manipulated through the liquid-liquid phase transition in the supercooled liquid region and the following quenching.

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