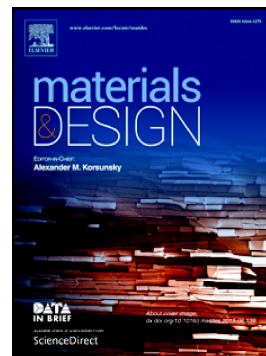


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A new strategy to design eutectic high-entropy alloys using simple mixture method

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Abstract

Eutectic high entropy alloys (EHEAs) hold promising industrial application potential, but how to design EHEA compositions remains challenging. In the present work, a simple and effective strategy by combining mixing enthalpy and constituent binary eutectic compositions was proposed to design EHEA compositions. This strategy was then applied to a series of (CoCrFeNi)M_x (M = Nb, Ta, Zr, Hf) HEAs, leading to the discovery of new EHEAs, namely, CoCrFeNiNb_{0.45}, CoCrFeNiTa_{0.4}, CoCrFeNiZr_{0.55} and CoCrFeNiHf_{0.4}. The microstructure of these new EHEAs comprised of FCC and Laves phases in the as-cast state. The experimental result shows that this new alloy design strategy can be used to locate new EHEAs effectively.

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