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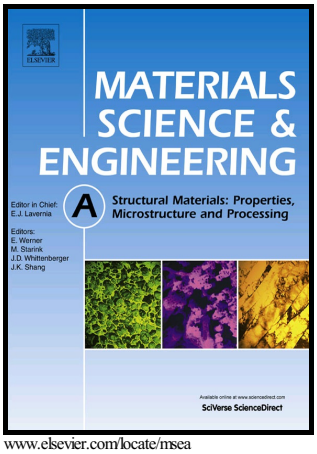

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PII: S0921-5093(18)30028-5
DOI: https://doi.org/10.1016/j.msea.2018.01.027
Reference: MSA35981

To appear in: *Materials Science & Engineering A*

Received date: 22 October 2017
Revised date: 5 January 2018
Accepted date: 6 January 2018

Cite this article as: Qiang Yang, Xin Qiu, Shuhui Lv, Fanzhi Meng, Kai Guan, Baishun Li, Deping Zhang, Yaqin Zhang, Xiaojuan Liu and Jian Meng, Deteriorated tensile creep resistance of a high-pressure die-cast Mg–4Al–4RE–0.3Mn alloy induced by substituting part RE with Ca, *Materials Science & Engineering A,* https://doi.org/10.1016/j.msea.2018.01.027

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Abstract

Tensile creep resistance of a high-pressure die-cast Mg–4Al–4RE–0.3Mn (AE44) alloy was significantly deteriorated after substituting part RE with Ca. According to traditional power-law creep theories, the stress exponent and the activation energy were revealed as 6 and 217 kJ/mol, which indicate inconsistent mechanisms of dislocation climb and dislocation cross-slip, respectively. Then, transmission electron microscopy (TEM) observations illustrate that dislocation substructures developed during creep are variational with precipitate characters in α-Mg grains, creep stress levels and creep temperatures. Therefore, both stress exponent and activation energy

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