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Crystallization behavior and microhardness evolution in Al92-xNi8Lax amorphous alloys



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Author(s): Sahoo KL, Wollgarten M, Kim KB, Banhart J**Source:** JOURNAL OF MATERIALS RESEARCH **Volume:** 20 **Issue:** 11 **Pages:** 2927-2933 **Published:** NOV 2005**Times Cited:** 10 **References:** 17 [Citation Map](#)

Abstract: The crystallization behavior of melt-spun amorphous Al_{92-x}Ni₈La_x (x = 4 to 6) alloys was investigated by means of differential scanning calorimetry, x-ray diffractometry, and transmission electron microscopy. Crystallization kinetics were analyzed by Kissinger and Johnson-Mehl-Avrami approaches. Microhardness of all the ribbons was examined at different temperatures and correlated with the corresponding structural evolution. The results show that the variation of La content from Al₈₈Ni₈La₄ to Al₈₆Ni₈La₆ has significant influence on the crystallization pathways from amorphous to stable crystalline phases and on the evolution of microhardness with temperature. The two stages of crystallization in Al₈₈Ni₈La₄ and Al₈₇Ni₈La₅ alloys correspond to formation of fcc-Al and Al₁₁La₃, Al₃Ni, Al₃La. In Al₈₆Ni₈La₆, three stages of crystallization are observed which correspond to formation of a metastable phase, fcc-Al, Al₁₁La₃, Al₃Ni, and Al₁₁La₃, Al₃Ni, Al₃La, and decomposition of a metastable phases to stable crystalline phases.

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E-mail Addresses: klsah@nmlindia.org**Publisher:** MATERIALS RESEARCH SOCIETY, 506 KEYSTONE DR, WARRENDALE, PA 15086 USA**Subject Category:** Materials Science, Multidisciplinary**IDS Number:** 981NN**ISSN:** 0884-2914**DOI:** 10.1557/JMR.2005.0385**Cited by: 10**

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