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The Electrochemical Properties of Melt-Spun $Al_{75-X}Si_{25}Ti_X$ Anode Materials for Lithium-Ion Batteries Powdered by Cryomilling

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Abstract- In this work, the effect of Ti addition (0, 1, 3, 5, 7, 10 wt%) on the electrochemical properties of Al-25Si alloys fabricated by melt spinning was investigated. Preparation of anode materials, the spinned types were powdered by cryomilling. The electrochemical measurement was performed on a battery analyzer (MTI BST8-3) using a constant current density of 0.05 $A.g^{-1}$ between two cut-off voltages of 0.1 and 4 V. The structures of alloys were analyzed by the X-ray diffractometry (XRD). Recently shown that the hardness of the AlSi alloyed by Ti is increased. The electrochemical point of view, this increase in hardness has suppressed the stability of the anode by pulverization and crack growth in active material and caused a decreasing in the battery performance.

Keywords- Al-Si Alloys, Titanium adding, Electrochemical performance, Rapid solidification, Cryogenic milling

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