

INFLUENCE OF THE ELECTROLYTE COMPOSITION ON THE CAPACITY FADE OF LITHIUM ALLOY ANODES

M. R. Wagner^{}, K.-C. Möller, J. O. Besenhard, M. Winter*

Institute for Chemical Technology of Inorganic Materials

Graz University of Technology, A-8010 Graz, Austria

^{}robby@sbox.tugraz.at*

It is widely accepted that the formation of an effective film (Solid Electrolyte Interphase, SEI) on the negative electrode is a most important prerequisite for good anode performance. Therefore the film formation has been studied extensively with regard to carbonaceous anode materials. However, film formation on lithium storage alloys may proceed in a different way than on carbonaceous anode materials. The electrolyte decomposition mechanisms on lithium alloys may be more similar to lithium metal than to carbonaceous materials. As a consequence, electrolyte additives or functional electrolyte components that work well with carbonaceous anode materials may fail with lithium storage alloys and vice versa ^[1]. Although the situation with the SEI formation is quite difficult, there are chances to improve the cycling stability of lithium storage alloys by using new functional electrolytes and appropriate charging procedures that may cause beneficial SEI properties. From our preliminary work ^[2] we have acknowledged that for achieving some progress with the cycling stability of lithium storage alloys completely different electrolyte components than those applied with graphite anodes seem to be necessary. This contribution will present the effect of functional electrolyte components on the cycling stability of lithium alloy anodes.

Support by the Austrian Science Funds through the special research program "Electroactive Materials" is gratefully acknowledged.

[1] M. R. Wagner, H. J. Santner, K.-C. Möller, M. Wachtler, W. Kern, J. O. Besenhard, M. Winter, 11th IMLB, Monterey, USA, Abstract. No. 245

[2] M. R. Wagner, K.-C. Möller, J. O. Besenhard, M. Winter, 203rd ECS Meeting, Paris, France, 2003