

Performance of modified polysaccharides by the introduction of SO₃H as binders for LTO anodes in lithium-ion batteries

He Chengxiang, Yanchunxiao Qi, 김진영, Gendensuren Bolormaa, 오은석[†]
울산대학교
(esoh1@ulsan.ac.kr[†])

In this research, we used chemical agents EDC (1-Ethyl-3-(3-dimethylaminopropyl)-carbodiimide) and NHS (N-Hydroxysuccinimide) to activate -COOH groups on traditional sodium alginate(Alg) and carboxymethyl cellulose(CMC) binders, and then introduced the -SO₃H group to the backbone of the Alg and CMC by 3-amino-1-propanesulfonic acid through an amidation reaction. Finally, new modified binders, noted as Alg-S and CMC-S, were successfully synthesized and used as binders for high-powered lithium titanium oxide anodes in lithium-ion battery. The aim of this study was to increase the ionic conductivity and to improve the electrochemical performance of the LIB cells compared to typical commercial Alg and CMC binder. The structure of modified binders have been characterized by nuclear magnetic resonance (NMR) and FT-IR. Cycling test and other electrochemical tests have been measured and tested.