Short Communication

Renovation of Lithium Cobalt Oxide from Spent Lithium Ion Batteries by an Aqueous Pulsed Discharge Plasma

Shuguang Zhu^{1,2,*}, Ying Qin¹, Jin Zhang¹

¹ Anhui Advanced Technology Research Institute of Green Building, Anhui Jianzhu University, Hefei 230601, China

² Shanghai Cooperative Centre for WEEE Recycling, Shanghai Second Polytechnic University, Shanghai 201209, China

*E-mail: 286537056@qq.com

doi: 10.20964/2016.07.103

Received: 28 January 2016 / Accepted: 11 March 2016 / Published: 4 June 2016

Used LiCoO₂ cathode material in spent lithium ion batteries was renovate in 0.1 M LiOH solution using aqueous pulsed discharge plasma for 30 min, in which aqueous pulsed discharge plasma was used for the first time as an alternative process to renovate its electrochemical characteristics. After treatment, the microstructure of spent and renovated LiCoO₂ has been studied by Raman spectroscopy, and the results obtained were compared with those by XRD and SEM, respectively. Experimental results showed that electrohydraulic cavitation could be effectively used to remove organic substance stuck on LiCoO₂ surface and facilitate the ordered crystalline layer compound processes. The validity of the process has been evaluated by electrochemical test. Its charge capacity was 132.9 mAh g⁻¹ in the first cycle and the discharge capacity was 126.7 mAh g⁻¹, which was retained 97.2 % after 50 cycles.

Keywords: Spent lithium-ion batteries; LiCoO₂; aqueous pulsed discharge plasma; renovation

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