Supplementary Material (ESI) for *Journal of Materials Chemistry*

Enhanced electrochemical lithium storage activity of $LiCrO_2$ by size effect

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Supporting information:

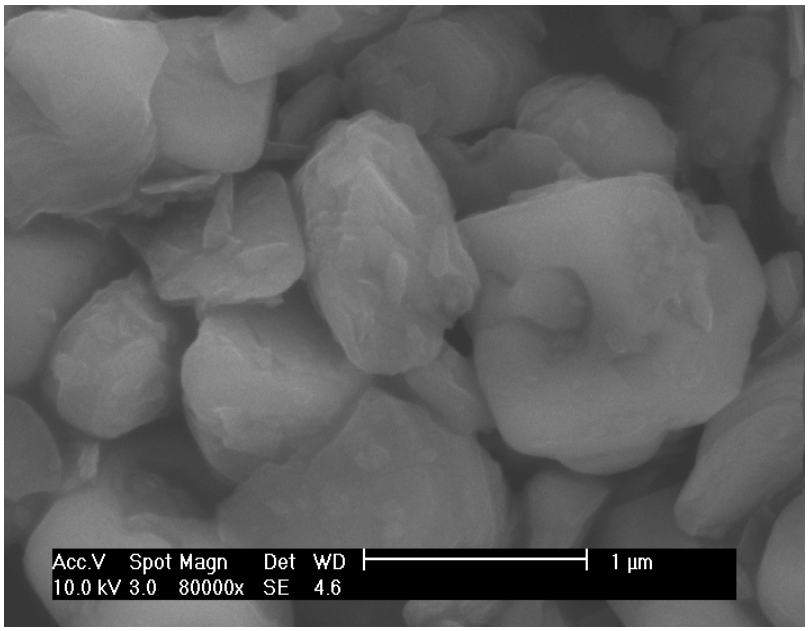

Figure S1 SEM image of the $LiCrO_2$ sample (a)

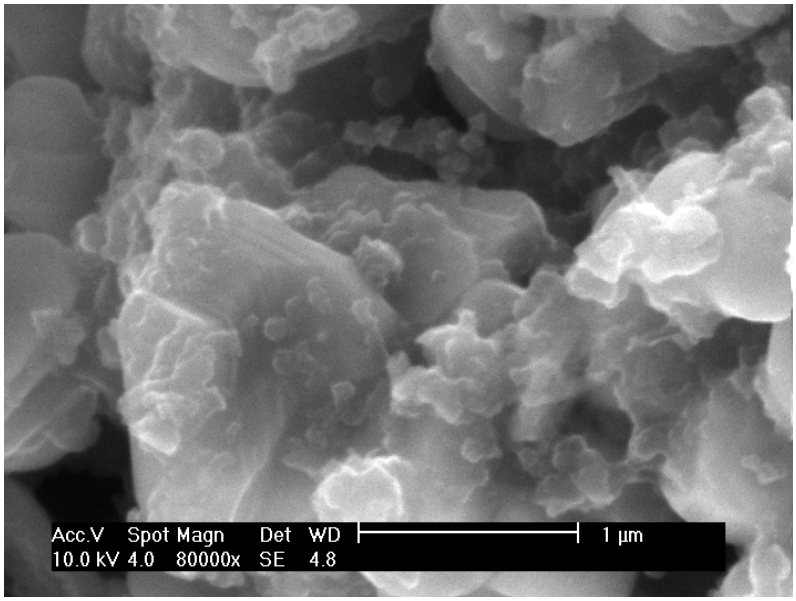

Figure S1 SEM image of the $LiCrO_2$ sample (b)

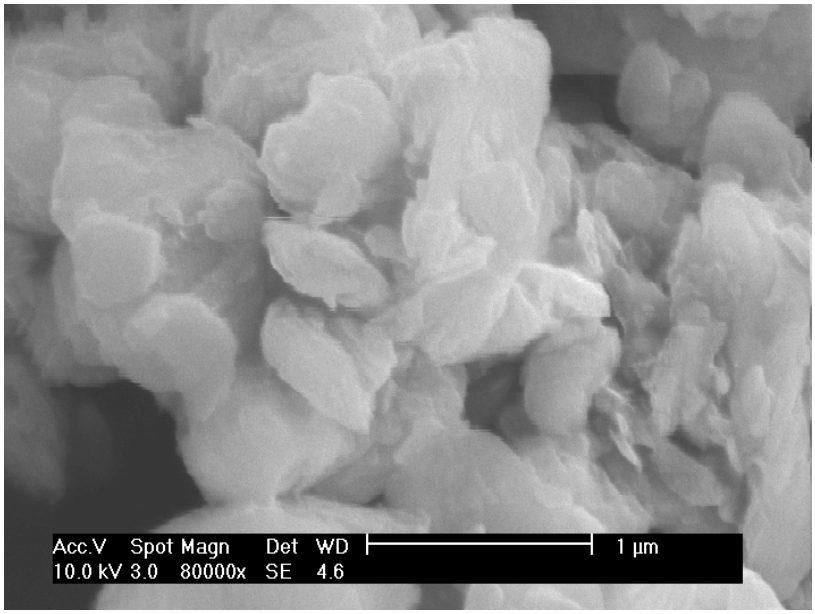

Figure S1 SEM image of the $LiCrO_2$ sample (c)

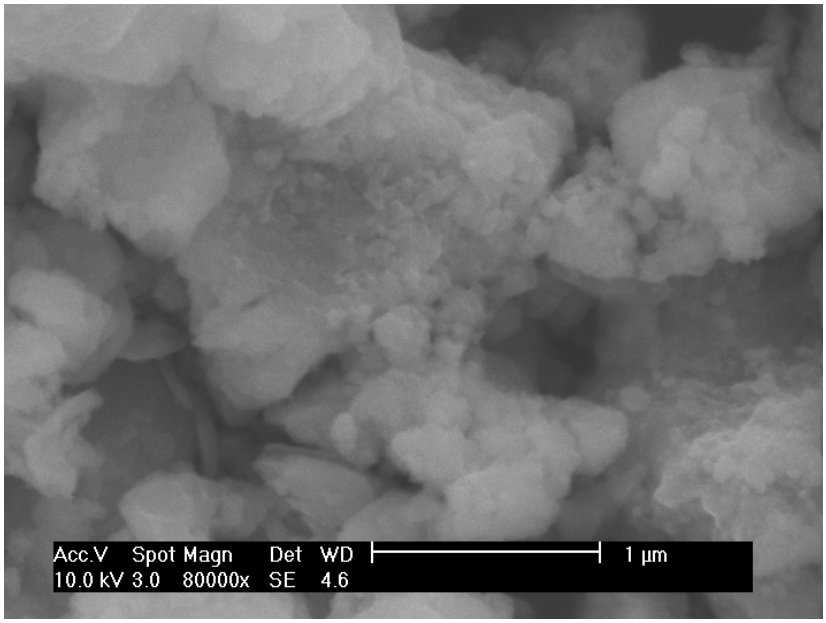

Figure S1 SEM image of the $LiCrO_2$ sample (d)

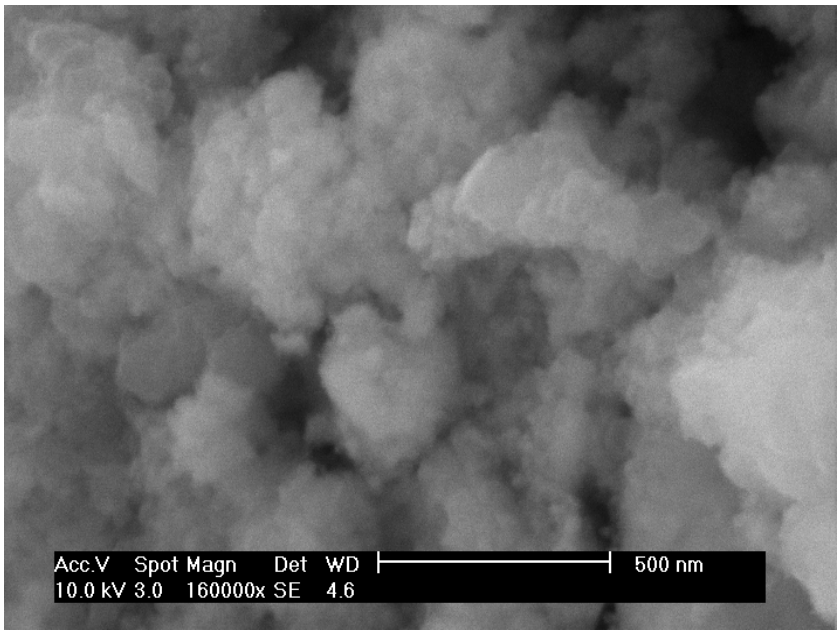

Figure S1 SEM image of the $LiCrO_2$ sample (e)

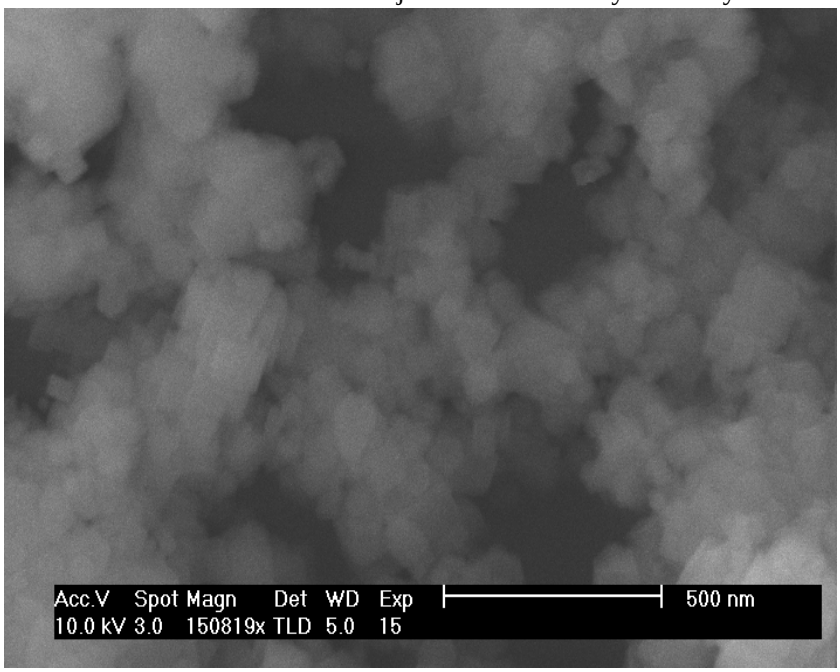

Figure S1 SEM image of the $LiCrO_2$ sample (f)

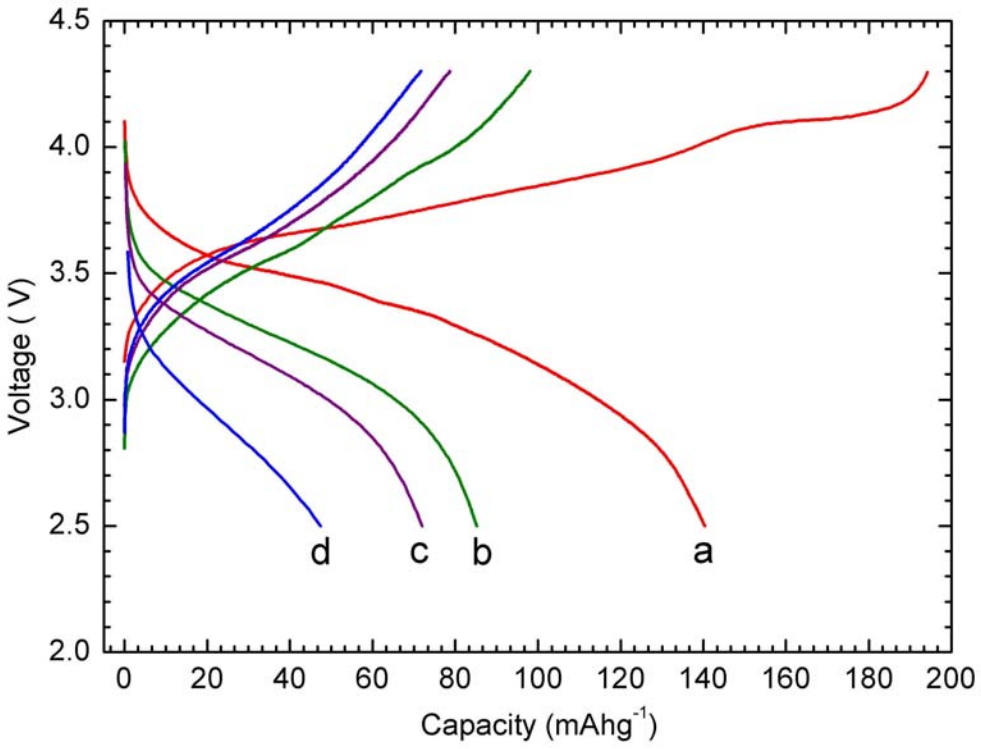

Figure S2 Rate performance of the $LiCrO_2$ electrode for the sample (e). Charged at 0.04 mA, discharged at (a): 0.04 mA, C/16, (b): 0.08 mA, C/8, (c): 0.16 mA, 1/4, (d) 0.64 mA, 1C.

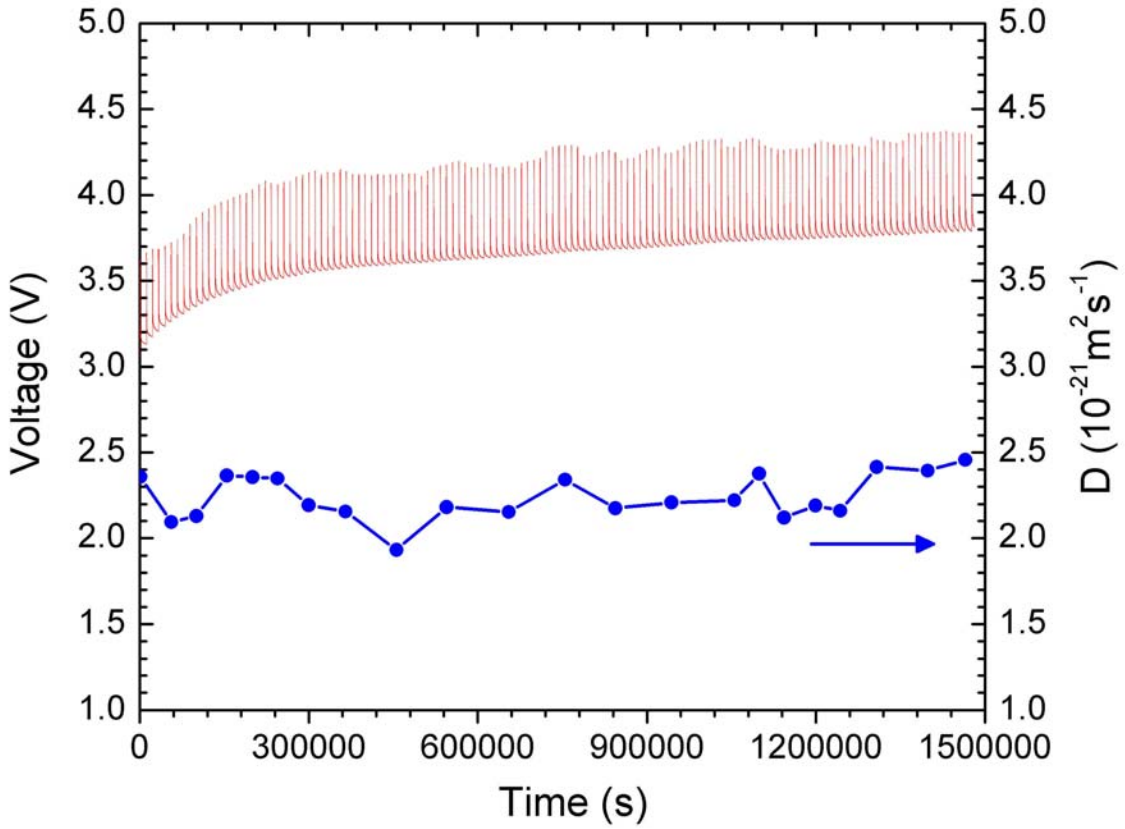

Figure S3: GITT (red line) and apparent diffusion coefficient curves (blue line-symbol curve) of the $LiCrO_2$ electrode for the sample (e) at room temperature. GITT measuring mode: applied current: 0.032 mA, applied period: 5 minutes, relaxation period: 3 hours. The lowest values in the red line represent open circuit voltage for each measured point after 3 hours relaxation.

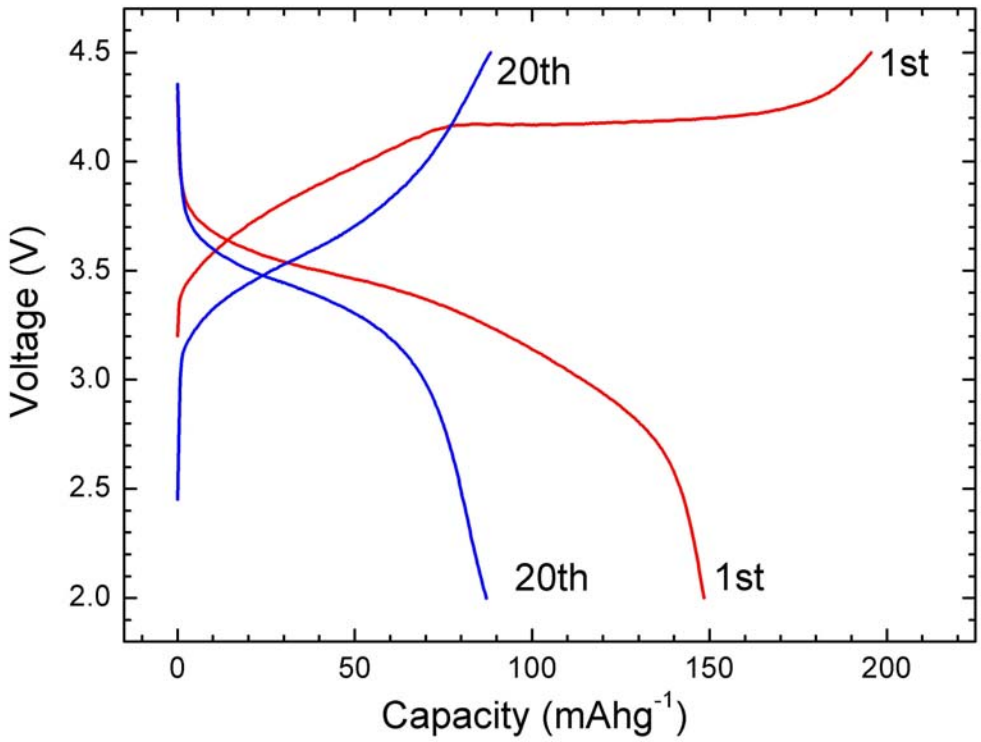

Figure S4. Voltage profiles of the $LiCrO_2$ electrode for the sample (e) at the first cycle and at 20^{th} cycle at room temperature.

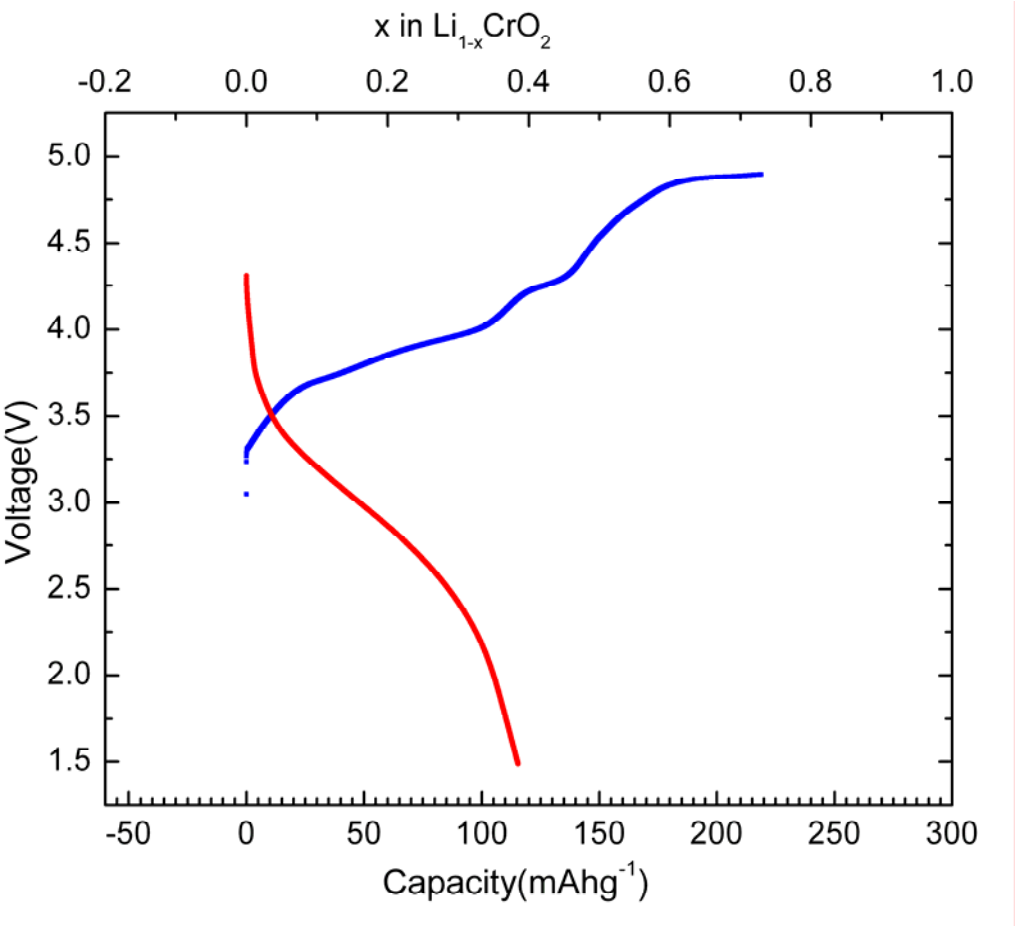

Figure S5 The charging/discharging curves of the $LiCrO_2$ electrode for the sample (d) during *in situ* XRD measurements at the first cycle. Selection of the sample (d) for *in situ* XRD was due to its strong XRD signal compared to that of the sample (e) as shown in Fig. 5. Its electrochemical reactivity is slightly higher than the one shown in Fig. 6, perhaps due to the difference between the *in situ* cell and the *ex situ* cell. The rate was similar.

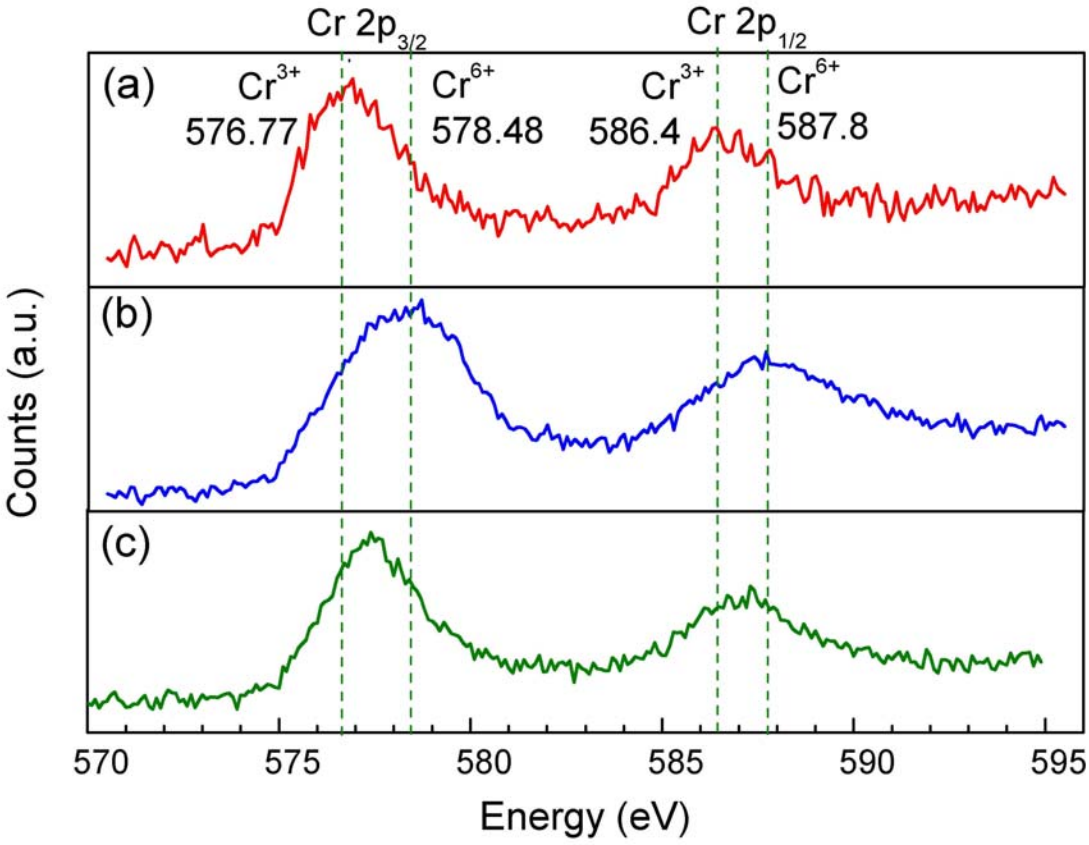

Figure S6 XPS spectra of the $LiCrO_2$ electrode for the sample (e) at initial state (a), charged to 4.3 V (b) and then discharged to 2.5 V (c).