

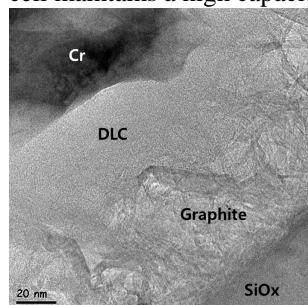
## Characteristics of Diamond like Carbon/Cr Double Layers Coating on Silicon monoxide-Carbon Composite Anode for Li Ion Battery

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Owing to high energy density, Silicon monoxide (SiO) is an attractive anode material for lithium ion battery. However, because of its huge volume change and reaction with electrolyte and low electrical conductivity, it has a poor cycle behavior. Effects of diamond like carbon (DLC)/Cr double layer coating on SiO-Carbon composite anode have been studied to improve the electrochemical characteristics of the Silicon monoxide. DLC is coated through Plasma enhanced chemical vapor deposition and then the Cr is sputtered on the SiO-C composite electrode. DLC and Cr are identified by TEM, Raman and EPMA. The DLC/Cr coated SiO-C anode/LiCoO<sub>2</sub> cathode full cells were assembled in an argon-filled glove box. The charge capacity of the double-layer coated anode (591mAh/g) cell is higher than that of the non-coated anode (517mAh/g) cell at the 1<sup>st</sup> cycle. The 50<sup>th</sup> cycle capacity retention is 83% and is also larger than that of the non-coated anode cell, which is 59 % at 0.5C rate. The electrochemical characteristics of the coated cell rationalized through impedance analysis, EDX and SEM. Because DLC has high young's modulus and chemical stability and Cr has high electrical conductivity, the double-layer coated cell maintains a high capacity during cycling.



Reference to a journal publication

[1] A. Netz, R.A. Huggins, W. Weppner, J. Power Sources 1 (2003) 5271.

[2] H.-Y. Lee, S.-M. Lee, Electrochem. Commun. 6 (2004) 465–469.