

4th International Conference on **Electrochemistry**

June 11-12, 2018 | Rome, Italy

Development of multilayered porous composite silicon/graphite/metal oxide thin film anodes for Li – ion batteries**V Madhusudhan Rao¹** and **M Venkateswarlu²**¹Vignan's University, India²Amara Raja Batteries Ltd., India

Multilayered porous composite silicon/graphite/metal oxide thin films are produced using chemical vapour deposition (CVD) and sputtering techniques as potential anode material for lithium-ion batteries. The x-ray diffraction (XRD) and Fourier transform infrared spectroscopy studies confirmed the phase and structural co-ordination. The formation of uniform silicon and graphite layers are confirmed by high resolution transmission electron microscopy (HRTEM) and energy dispersive x-ray spectroscopy (EDS). Li insertion/extraction evaluation was performed mainly with cyclic voltammetry (CV) and constant current charge discharge cycling. The cycleability and Li ion accommodation capacity were found to depend on the film thickness. Film of thickness upto 500 Å gave charge capacity over 4100 mAh g⁻¹ and maintained upto 100 cycles, while a 1000 Å and more thick films were able to give capacity upto 2500 mAh. g⁻¹. The performance of thin films of thickness less than 500 Å (Sample 1), less than 1000 Å (Sample 2) and more than 1000 Å is shown in the graph .

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