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5.1. Structure of (a) crystalline V$_2$O$_5$ and (b) V$_2$O$_5$ xerogels. In crystalline V$_2$O$_5$, single layers of V$_2$O$_5$ are arranged in orderly manner whereas in V$_2$O$_5$ xerogel, bilayers of single V$_2$O$_5$ layers are arranged as stacks along the c-axis of monoclinic unit cell. Oxygen coordination of vanadium resembles a square pyramid in both structures. Oxygen atoms shown between the layers represent oxygen of water molecules.

5.2. Schematic illustration for the Synthesis and the Structure of V$_2$O$_5$/CNTs.
The functionalization of carbon nano tubes in step-1 results in the modification of CNT surface with functional groups like -OH, -COO', -CO, etc. Vanadium alkoxide, (VO(OR)₃), hydrolyzes to vanadium oxytrihydroxide, (VO(OH)₃), that undergoes co-ordination expansion with functional groups present on CNT surface as depicted by the inflated picture at the bottom followed by condensation to V₂O₅ layers grafted on CNTs.

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5.11. The plots of $v^{1/2}$ vs. $i/v^{1/2}$ used for calculating constants $a_1$ and $a_2$ at different potentials.

According to power law relationship, $i = av$ for non diffusion limited processes and $i = av^{1/2}$ for diffusion limited processes. Thus, total current $i = av + av^{1/2}$ and $i(V)/v^{1/2} = a_1v^{1/2} + a_2$. Current values at different potentials were calculated from cyclic voltammogram at different scan rates of 0.1 to 5 mV/sec. Plots of $i/v^{1/2}$ vs. $v^{1/2}$ have been drawn at different potentials and from the straight line obtained value of $a_1$ (slope) and $a_2$ (intercept) are calculated.

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