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# A Facile Way to Prepare Sandwich Structure of Silicon/Parallel Aligned Graphene Anode Materials for Li-Ion Batteries

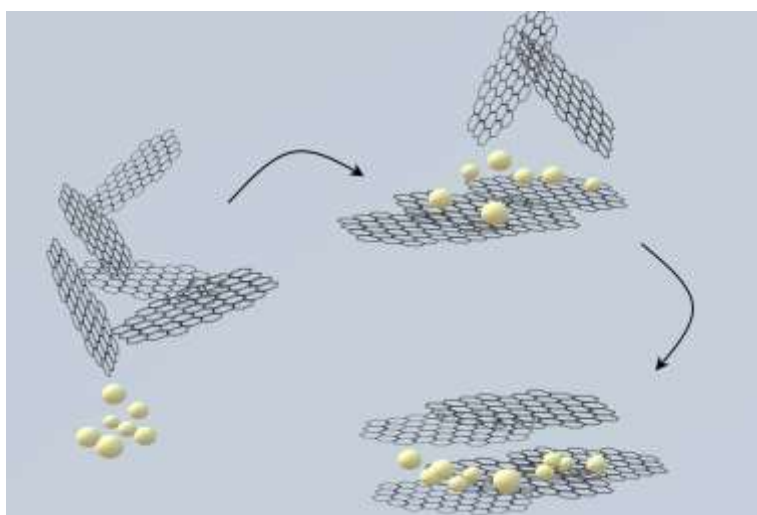
## Abstract

Graphene-coated silicon anode material is considered as a promising candidate for lithium ion batteries (LIBs).<sup>[1,2]</sup> However, existing complex preparation process of graphene-coated silicon anodes and the large capacity loss seriously restricts their practical applications in LIBs.<sup>[3]</sup> Here, a facile synthesis of a sandwich structure which are composed of silicon and parallel aligned graphene (G/Si/G) is reported. The G/Si/G is prepared via a horizontal self-assembly method. In two mutually incompatible solvents, non-functionalized thin layer graphene is horizontally spread under the interfacial shear force. After removing the solution, the parallel graphene is covered on silicon nanoparticles, producing a sandwich structure of silicon / parallel aligned graphene. The G/Si/G retain a stable capacity of 551 mAh/g up to 650 cycles at 0.1 A/g, with a capacity degradation of only 0.032% per cycle. Indicating that the horizontal graphene layer could significantly improves the electrochemical performance of the G/Si/G electrode.

## References

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## Figures



**Figure 1:** A brief sketch of the preparation process