

## A novel ionic host solid electrolyte interface formation on reduced graphene oxide of lithium ion battery

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### Abstract

Challenges to developing lithium-ion batteries include achieving high-energy density, low irreversibility, and lithium-ion transportation at electrode material interfaces. Numerous studies have used ameliorative electrode surfaces, composite materials, or modified electrolytes to improve battery performance.<sup>1-5</sup> This study creates an ionic host solid-electrolyte interface (SEI) material using electrochemical self-polymerization. This ionic host SEI is fabricated with carbon oxide-containing functional groups -C-O- and -O-C(O)- on a reduced graphene oxide (rGO) anode surface to improve the performance of lithium-ion battery, including reversible capacity, c-rate, and cycle ability. The results show that the ionic host SEIs on rGO material provides additional 84% of energy density increment. Compared to the graphite material, the energy density can only be increased 3.7% because of the lack of functional groups on the graphite surface. By using this technique to fabricate functional groups on electrode surfaces and prepare suitable electrolyte additives, lithium-ion batteries perform better performance and exceed previous manufacturing processes.

### References

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