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## **Review of symmetry and structure relationships of the stage-I graphite intercalation compounds (GICs) structure family**

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Understanding the lithium intercalation into graphite is crucial for lithium ion batteries, however still incompletely understood.

To improve the understanding of the phase transition mechanism, we review published binary stage-1 GIC structures from the ICSD-database, fundamental structural aspects like bonding distances and packing arrangements and explore their symmetry relationships applying group-subgroup considerations. This will help in the analysis of measured diffraction data of LIBs.

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