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**Solid State Zwitterions realized on carbon graphenic surface**

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Zwitterions are single molecular species that combine anionic and cationic groups. Here we consider the prospects for introducing the concept of a zwitterion into the solid state, by combining geometrically incompatible anionic and cationic moieties within a single extended structural element whose covalent rigidity frustrates the close approach of the anionic and cationic regions. Specifically, first principles computations for anionic and cationic groups such as NH<sub>3</sub> and CO<sub>2</sub> covalently attached to a graphenic surface via linker elements demonstrate long-range charge transfer, the hallmark of a zwitterion, while maintaining overall structural integrity.

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