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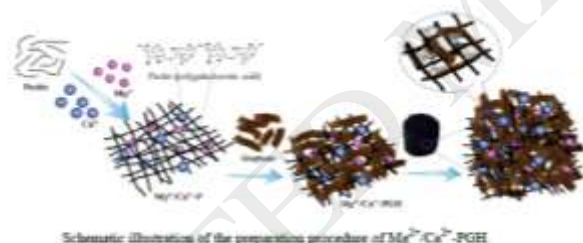
# Self-assembly of flexible graphene hydrogel electrode based on crosslinked pectin-cations

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Graphical abstract



Schematic illustration of the preparation procedure of  $\text{Mg}^{2+}/\text{Ca}^{2+}$ -PGH.

## Highlights

1. Pectin was chelated with cations ( $\text{Mg}^{2+}/\text{Ca}^{2+}$ ) to form an interwoven framework;
2. the graphene hydrogels were micro-regulated by the synergistic effects of pectin-cations;
3. The achieved highest specific capacitance of the  $\text{Mg}^{2+}/\text{Ca}^{2+}$ -P pectin graphene hydrogel ( $\text{Mg}^{2+}/\text{Ca}^{2+}$ -PGH) electrode was  $839.2 \text{ F g}^{-1}$  at  $1 \text{ A g}^{-1}$ ;
4. The  $\text{Mg}^{2+}/\text{Ca}^{2+}$ -PGH electrode showed high coulombic efficiency of 191.8% at  $1 \text{ A g}^{-1}$ ;
5. The assembled flexible supercapacitor displayed excellent capacitance retention of 98.5% after 2000 charge/discharge cycles.

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