

Crown-Ether Derived Graphene Hybrid Composite for Membrane-Free Potentiometric Sensing of Alkali Metal Ions - DTU Orbit (08/11/2017)

Crown-Ether Derived Graphene Hybrid Composite for Membrane-Free Potentiometric Sensing of Alkali Metal Ions

We report the design and synthesis of newly functionalized graphene hybrid material that can be used for selective membrane-free potentiometric detection of alkali metal ions, represented by potassium ions. Reduced graphene oxide (RGO) functionalized covalently by 18-crown[6] ether with a dense surface coverage is achieved by the introduction of a flexible linking molecule. The resulting hybrid composite is highly stable and is capable of detecting potassium ions down to micromolar ranges with a selectivity over other cations (including Ca^{2+} , Li^+ , Na^+ , NH_4^+) at concentrations up to 25 mM. This material can be combined further with disposable chips, demonstrating its promise as an effective ion-selective sensing component for practical applications.

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