

## Tuning the physico-electrochemical properties of novel cobalt (II) octa[(3,5-biscarboxylate)-phenoxy] phthalocyanine complex using phenylamine-functionalised SWCNTs

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### ABSTRACT

The integration of phenylamine-functionalised SWCNTs (SWCNT-phenylamine) with a novel cobalt (II) octa[(3,5-biscarboxylate)-phenoxy] phthalocyanine (CoOBPPc) complex has been described. The physical and electrochemical properties of the CoOBPPc-SWCNT-phenylamine hybrid were evaluated using spectroscopy (IR and UV-vis), field emission scanning electron microscopy and electrochemistry (cyclic voltammetry and electrochemical impedance spectroscopy). Integration of SWCNT-phenylamine resulted in the physical transformation of the CoOBPPc from the usually bluish colour of cobalt phthalocyanine complexes to a beautiful bright green colour. In addition, the heterogeneous electron transfer kinetics and electrocatalytic properties of the CoOBPPc were greatly enhanced following the attachment of the SWCNT-phenylamine. The potential electrocatalytic application of the hybrid was tested using b-nicotinamide adenine dinucleotide (NADH) as a model biological analyte. Interestingly, the onset oxidation potential of this analyte was significantly reduced (300 mV) by this hybrid compared to the bare electrode.