

## From shear exfoliation of graphite in Coca-Cola® to few-layer graphene for smart ink

*Zulhelmi Ismail<sup>a,b</sup>, Wan Farhana W. Idris<sup>a</sup>, Abu Hannifa Abdullah<sup>a</sup>*

<sup>a</sup> College of Engineering (COE), Universiti Malaysia Pahang, Malaysia

<sup>b</sup> Centre for Research in Advanced Fluid and Processes (CARRIF), Universiti Malaysia Pahang, Malaysia

### **ABSTRACT**

Liquid-phase exfoliation of few-layer graphene in Coca-Cola<sup>®</sup> was performed by a kitchen blender for rapid preparation of strain/light/humidity sensitive ink. The advantages of Coca-Cola as an exfoliating medium have been identified from the low structural defect ( $I_D/I_G = 0.39$ ) and, moderate carbon to oxygen ratio ( $C/O = 2.6$ ) obtained by the resulting graphene. It is discovered that a deposition of graphene on photo paper allowed a facile fabrication of smart paper that is able to detect minor strain (0 – 2.0%) with GF of 18.7. Meanwhile, the multi-responsiveness of ink towards light/humidity had been validated from the 10 s response time after the exposure to stimulants with the maximum resulting curvature degree of 16° and 14° under light and humidity changes, respectively. Finally, it is shown that our actuator is able to vertically lift a load (545 mg) from its initial flat position upon irradiation of light (200 mW/cm<sup>2</sup>).

### **KEYWORDS**

Smart ink; Few-layer graphene; Coca-Cola; Actuator; Light and humidity driven

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