

Synthesis of fullerene on the surface of carbon nanoparticle by arc discharge method

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Fullerenes materials have received wide attention due to their biomedical applications such as photodynamic therapy and magnetic resonance imaging [1]. The major limitations of realizing the practical applications of fullerenes are high cost and low production yield [2]. The arc discharge is well known technique for synthesis of carbon base materials. Here, we report the synthesis of fullerene on the carbon nanoparticle surface (FOCNPs). The precursor component and its new delivery system allowed a facile and continuous synthesis; which increased the production yield in comparison with previous arc discharge designs [3]. FOCNPs were observed and analyzed by high resolution TEM. The carbon structure along the periphery were thin enough for observation of a single fullerene molecules structure that were fullerenic. Similar fullerenic structure have been obtained by other methods and are reported in literatures [4, 5].

1. Partha R and Conyers JL, International journal of nanomedicine. 4 (2009) 261.
2. Wang J, Hu Z, Xu J and Zhao Y, Nature publishing group asia materials. 6 (2014) e84.
3. Aguayo N A. University of Barcelona, (2012).
4. Goel A, Howard JB and Vander Sande J B, Carbon, 10 (2004) 1907-15.
5. Goel A, Hebgen P, Vander Sande J B and Howard J B, Carbon, 2 (2002) 177-82.