

4<sup>th</sup> International Conference and Expo on

# Ceramics and Composite Materials

May 14-15, 2018 | Rome, Italy

## 1D Carbonaceous hybrid noble nanometal core-shell composite for battery grids to enhance the performance of lead acid batteries

Natarajan N, Yumna Khan, Balaji S, Aman Shaikh, Sharanya Prakash, Dhanashri Dhuri, Bipin Patil, Amit Kalyani and Sujatha Pushpakanth  
Kalyani Centre For Technology And Innovation, Bharat Forge Limited, India

The present study is to investigate the formation of 1D carbon coated with noble metal core shell's nanoparticles and the novel composites helps in the fabricating a Hybrid lead-acid battery to improve the electrochemical performance for high end application-hybrid batteries. The core shell (Ag@Au) was synthesized using natural reducing agents favoring the "go green methods" by first reducing the silver salts using *Cymbopogon citratus* (lemon grass) extract followed by the addition of gold solution (Chlorauric acid) on the surface of silver nanoparticles where in Nano silver acts as a self-reducing agent to form Nano gold shell as shown in the schematic diagram (A). The core shell of Au@Ag Nano particles was synthesized by using lemon grass as reducing agent for the Nano core gold (chlorauric acid) followed by the addition of silver salt solution kept in Hydrazine atmosphere to obtain the core shell Au@Ag, ( Schematic diagram B )which leads to the formation of bimetallic Au core–Ag shell & Ag Core- Au shell nanoparticles. The well stabilized core shell was further added to functionalize MWCNT-COOH & MWCNT-NH<sub>2</sub> to make the Nano-composites of MWCNT- Noble metal core shell, investigated through XRD & TEM. The Nano composite is coated on the lead acid battery grid and the same was confirmed by SEM & EDAX. The capacity of the battery performance was improved to 10 % from C1 & C10 test.

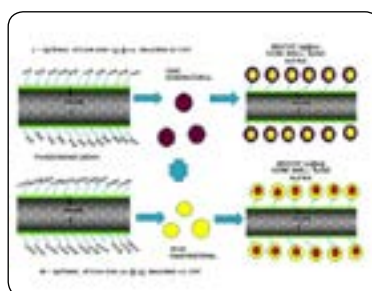


Fig:1. Schematic representation of 1D carbonaceous core shell Nobel metal nano composites for hybrid batteries.

### Recent Publications:

1. M. Saravanan,‡ M. Ganesan and S. Ambalavanan\* Enhanced electrochemical performance of a lead–acid battery by a surface modified negative grid with multiwall carbon nanotube coating. Journal @The Royal Society of Chemistry 2015 RSC Adv., 2015, 5, 26081–26091 | 26081
2. Dipali Nagaonkar, Mahendra Rai\*, sequentially reduced biogenic silver-gold nanoparticles with enhanced antimicrobial potential over silver and gold monometallic nanoparticles, Journal of Adv. Mater. Lett. 2015, 6(4), 334-341.

### Biography

Mr. Natarajan .N has expertise in nanomaterial synthesis and characterization, mainly focusing on the nanomaterials and biomaterial towards various applications like medical devices, Metal Injection Moulding and energy storage system. He has 5 India patents application filed and 2 International Journal Publications.

natarajan.n@bharatforge.com