



ICMSET 2020

2020 9th International Conference on
Material Science and Engineering Technology

ICCME 2020

2020 7th International Conference on
Chemical and Material Engineering

October 9-12, 2020 | Kyoto, Japan

Sponsored by



Supported by



FE-SEM-EDS. In all fabrics, the 100% cotton and the blended fabrics showed the highest portion of AgNPs on the surface while the 100% polyester showed a very minimal amount of AgNPs. The 100% cotton and 100% polyester were then characterized for their antibacterial activity with *Klebsiella pneumoniae* and *Staphylococcus aureus*.

14:45-15:00



ET20-317

Presenter: K. Vignarooban

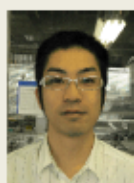
From: University of Jaffna, Sri Lanka

Title: Gel Polymer Electrolytes for Sodium Batteries Raman and Electrochemical Impedance Spectroscopic Studies

Authors: G. Menisha, J.H.T. B. Jayamaha, K. Vignarooban, G. Sashikesh, K. Velauthamurthy, H.W.M.A.C. Wijayasinghe and M.A.K.L. Dissanayake

Abstract: Sodium-ion batteries (SIBs) as low-cost alternatives to expensive lithium-ion batteries become a hot R&D topic in the recent days due to the natural abundance of sodium in the Earth's crust and also in the oceans. As far as solid electrolytes for SIBs are concerned, larger size of Na^+ ions compared to that of Li^+ ions hinders the ionic mobility resulting to insufficient ionic conductivity for practical applications. Development of quasi-solid state gel-polymer electrolytes (GPEs) would be a feasible solution to overcome this challenge. In this work, we developed Poly (methyl methacrylate) (PMMA) based GPEs with six different compositions dissolved in EC:PC (ethylene carbonate and propylene carbonate, 1:1 wt%) mixture. Among six different GPE samples investigated by Electrochemical Impedance Spectroscopic (EIS) and Raman Spectroscopic techniques, the best ambient temperature ionic conductivity of 4.2 mS cm^{-1} was obtained for 9PMMA:9NaPF₆:41EC:41PC (wt%). Variation of ionic conductivity with inverse temperature showed Arrhenius behavior with almost constant activation energies. The best conducting GPE showed an activation energy of 0.14 eV. In the Raman spectra, very sharp crystalline peaks (400-850 cm^{-1} wave number range) of NaPF₆ disappear in the gel state of the electrolytes confirming the non-crystalline nature of the GPEs. Boson modes remain almost constant in intensity for all the six different compositions. The best conducting GPE seems to be highly suitable for practical applications in SIBs as it has sufficient ambient temperature ionic conductivity.

15:00-15:15



ET20-313-A

Presenter: Syun Gohda

From: NIPPON SHOKUBAI CO., LTD., Japan

Title: Highly Soluble Oxygen-Containing Carbon Materials Prepared from Phloroglucinol

Authors: Syun Gohda, Hironobu Ono, Yasuhiro Yamada

Abstract: High solubility and dispersibility of nanocarbon materials are important to compose with the other materials such as resin. Graphene oxides (GO) is one of the oxygen-containing nanocarbon materials with high dispersibility, and it has been developed for various applications. However, it is too dangerous to manufacture GO at a large scale because it needs severe process using strong acids and oxidants. Therefore, the methods for manufacturing highly soluble carbon materials safely, stably, and cleanly are essential. In this work, highly soluble oxygen-containing nanocarbon materials were synthesized in high yield by simply pyrolysis of phloroglucinol. Phloroglucinol has symmetric three hydroxyl groups and high