Contribution ID: **161** Type: **Oral presentaion**

Synthesis of Nitrogen-Rich Carbonaceous with High Porous Volume for Supercapacitor Application

Thursday 9 June 2016 10:15 (15 minutes)

The nitrogen (N)-rich carbonaceous material has gained remarkable interest fueled by their potential use as high energy density materials for electrical storage. Using this materials as primary components in supercapacitor electrode gives a superior ability to form double-layer charge coupling, therefore capacitance increase significantly. In this work, we introduce a novel method to convert biowaste into carbonaceous materials, in this case, spent coffee ground. The raw material is selected due to their naturally containing of high amount of nitrogen. The synthesizing process is composed of two major steps, hydrothermal and chemical activation using KOH. The effect of chemical ratio between N-rich biochar and KOH on surface area and specific capacitance significant was investigated from 1:1 –1:4. The resulted carbon structure obtained the nitrogen content as high as 1.8 wt.%. The best condition to produce a high porous N-rich carbonaceous was 1:4 (Biochar: KOH) with BET surface area of 1,115 m2/g and porous volume of 0.53 cm3/g. The carbonaceous was used to fabricate high efficiency electrodes for supercapacitor and provided the specific capacitance of 165 F/g at scan rate 0.05 V/s in 6 M KOH electrolyte.

Author: Ms SANGPRASERT, Thanyathorn (Center of Excellence in Environmental Catalysis and Adsorption, Thammasat University, Pathumthani 12120, Thailand, Department of Chemical Engineering, Faculty of Engineering, Thammasat University, Pathumthani, Thailand)

Co-authors: Ms VAYACHUTA, Lapporn (National Nanotechnology Center (NANOTEC), National Science and Technology Development Agency (NSTDA), Pathumthani, Thailand); Mr GRISDANURAK, Nurak (Center of Excellence in Environmental Catalysis and Adsorption, Thammasat University, Pathumthani 12120, Thailand, Department of Chemical Engineering, Faculty of Engineering,Thammasat University, Pathumthani 12120, Thailand.); Mr KHANCHAITIT, Paisan (National Nanotechnology Center (NANOTEC), National Science and Technology Development Agency (NSTDA), Pathumthani, Thailand); Mr KHEMTHONG, Pongtanawat (National Nanotechnology Center (NANOTEC), National Science and Technology Development Agency (NSTDA), Pathumthani, Thailand); Mr BOONKOOM, Thitikorn (National Nanotechnology Center (NANOTEC), National Science and Technology Development Agency (NSTDA), Pathumthani, Thailand)

Presenter: Ms SANGPRASERT, Thanyathorn (Center of Excellence in Environmental Catalysis and Adsorption, Thammasat University, Pathumthani 12120, Thailand, Department of Chemical Engineering, Faculty of Engineering, Thammasat University, Pathumthani, Thailand)

Session Classification: Session XVII

Track Classification: Environmental Physics, Atmospheric Physics, Geophysics and Renewable Energy