General

Ts. Dr. Norazlianie produces portable carbon membrane for hydrogen purification

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Kuantan, 29 September 2020 - The new carbon membrane producers that offer supported carbon membrane in commercial-scale quantities prove that the current market focuses more on competitive and affordable unit price.

The auspicious patent development for this type of membrane in the last 5 years has made the lecturer of the Faculty of Mechanical and Automotive Engineering Technology (FTKMA), Universiti Malaysia Pahang (UMP), Ts. Dr. Norazlianie Sazali, 31 to produce portable carbon membrane for hydrogen purification.

This research also involves a lecturer from the College of Engineering (KK), Professor Dr. Ir. Mohd Faizal Jamlos and a lecturer from FTKMA, Associate Professor Dr. Saiful Anwar Che Ghani.

This research also receives support from Datuk Dr. Ahmad Fauzi Ismail and Dr. Wan Norharyati Wan Salleh from the Advanced Membrane Technology Research Centre (AMTEC), Universiti Teknologi Malaysia (UTM).

According to Ts. Dr. Norazlianie, this encouraging development shows that current industries prefer carbon membrane-based technology application.

“My research focuses on the development of portable carbon membrane model for hydrogen purification,” she said.

“I was inspired to develop this model during my PhD study.

“I studied the optimum condition for hydrogen purification using membrane technology,” she said.

She added that hydrogen gas can be obtained from nature, such as water, biomass, and fossil fuels.

“So, it is a loss if we do not utilise it to the fullest.”

“The carbon membrane developed is for hydrogen gas purification, and it has micro-sized pores.

“The mechanism involves molecular sieving where the hydrogen molecules will be separated from other molecules of different sizes through a membrane.

“Two important characteristics for this application are the weak interaction between hydrogen and membrane.

“The other characteristic is a certain energy barrier to distinguish between hydrogen gas and other

gases," she said.

This research was supported by the Ministry of Higher Education and UMP through the Fundamental Research Grant Scheme.

She hoped that she can purify hydrogen gas using the carbon membrane.

"This is because the materials and method of membrane fabrication play a crucial role in terms of cost, safety, and health.

"Hydrogen gas has the potential to solve the long-term problem of growing energy crisis owing to its high efficiency, high energy density, and abundant sources.

"This project is still on-going, and the actual cost has yet to be disclosed for now," she said.

She is currently planning to develop a membrane prototype to study its effectiveness in other gases purification, such as carbon dioxide, nitrogen, and oxygen.

The proposal is being drafted for collaboration with industries related to gas purification.

At the Creation, Innovation, Technology & Research Exposition (CITREx) 2020 organised by UMP on 12-13 February, this product won a gold medal and Special Award of CENLAB.

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