

Highlights Biotechnology



SHAH ALAM, July 12 – Malaysia’s first fully automated Polyhydroxylalkanoate (PHA) Bioplastics Pilot Plant was launched by Science, Technology and Innovation Minister Datuk Seri Dr. Maximus Johnity Ongkili at Jalan Beremban here today.

The plant is the first of its kind in bioreactor technology designed and fabricated in Malaysia as well as the region. It is a result of a smart partnership between MOSTI agency SIRIM Berhad, Universiti Sains Malaysia (USM), Universiti Putra Malaysia (UPM) and the MIT, US.

Also present at the event were SIRIM Chairman Datuk Hajah Kamaliah Kamis, SIRIM Vice-President of Research & Technology Development Division Dr Zainal Abidin Mohd Yusof, project leaders from the Massachusetts Institute of Technology (MIT) Prof. Anthony J. Sinskey and Prof. Rha Cho Kyun, MOSTI Undersecretary (Industrial Technology Division) Wan Zaharah Wan Mohamad and MOSTI Undersecretary (National Biotechnology Division) Prof Rofina Yasmin Othman. The project leader for USM is Assoc. Prof. Dr. Sudesh Kumar while UPM is led by Prof. Dr. Mohd. Ali Hassan.

Scaled-up to 2,000 litres, the bioreactor facilities and integrated manufacturing process of the plant are able to produce various options of PHA materials from crude palm kernel oil and palm oil mill effluent.

Bioplastic plant is vital as it will produce non-toxic products, which is in great demand in the food and packaging, agriculture and horticulture, medical, toys, and textile industries. There are expected to be more applications for bioplastics such as automotive and electronics industries in the near future.

The success of this pilot plant was backed up by the initial project under the Intensification of Research in Priority Areas (IRPA) which commenced in 2006. With the cloning of PHA biosynthesis genes by MIT, the project was then narrowed to two phases. SIRIM led the first phase involving PHA biosynthesis process and recovery research and development, overseeing the material and product testing and product development applications. The R&D was carried out by USM, UPM and MIT. ‘

The second phase, which obtained funding from MOSTI’s Technofound Programme, scaled up selected optimised processes of the first phase to pilot scale production capacity and the development of integrated manufacturing process.

The strain to produce PHA from crude palm kernel oil and its optimised processes that is ready for up-scaling were developed by USM, while UPM converted palm oil mill effluent into organic acid which was then fermented to produce a very useful bioplastic material known as PBHV (polyhydroxybutyrate-co-hydroxyvalerate). Meanwhile, the MIT expertise was utilised in metabolic engineering to develop recombinant strain that is competent in producing high yield of PHA.

“With a capacity of 2,000 litres, the plant is linked to the waste treatment system and specially designed to remediate the effluent of the pilot plant. I am confident that the establishment of this plant will further boost the production of our palm oil as it will become an important feedstock for biodegradable plastic in future,” said Datuk Seri Dr Maximus during the launch.

The minister added that current bioplastic market covered approximately 10 to 15 percent of the total plastic market share and this was expected to increase between 20 and- 30 percent by 2020.

He also pointed out that the cost of palm oil based bioplastics was much lower than other kinds in the market. “The current price of bioplastics from Brazil is at least RM 28 per kilogramme. By using palm kernel oil as the carbon source, we are able to bring down the cost of production to as low as RM 6 to7 per kilogramme,” he said.

SIRIM Vice President, Dr Zainal Abidin said the plant was totally designed and built locally by local engineers and fabrication of the reactors meets the Malaysian authority requirements.

“Through the establishment of the pilot plant SIRIM is ready to provide its services in designing bioreactor or pilot plant design for other projects to other institutions or commercial companies in the future. The success will also be a proof of capabilities to other countries that Malaysia is able to market its own home-grown technology at the global market apart from developing and scaling up plants to commercial scales,” he said.

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Aras 1-7, Block C4 & C5, Pusat Pentadbiran Kerajaan Persekutuan, 62662 Putrajaya, Wilayah Persekutuan
Tel : (603) 8885 8000 | Faks : (603) 8888 9070 | E-mel : info[at]mosti.gov.my