

UGM Labs Develop eNose and Anti-Smoke Mask

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Integrated Research and Testing Laboratory (LPPT) to facilitate the activities of research, training and testing for the development of science and technology. As a unit to support education, LPPT performs various testing services both inside and outside UGM. Throughout 2014, LPPT has provided research and testing services 1,467 times for government agencies and private agencies.

The Head of LPPT UGM, Tri Joko Raharjo, Ph.D., said that LPPT held customer gathering on Saturday (20/2) as one way to improve the quality of service on a regular basis and aspiration. Previously, LPPT has received feedback from the customer. During 2015 there were 1,210 customer feedbacks. "We want a meeting with the customer of LPPT and we hope we can absorb the aspirations relating to our services," said Tri Joko to reporters at UC UGM.

Tri Joko added that from many studies conducted by LPPT, at least two researches were exhibited in the customer meeting this time, namely electronic nose and anti-smoke masks. Two of these products were developed by Dr. Kuwat Triyana, M.Sc.

To reporters, Kuwat Triyana explained, the electronic nose or eNose was developed to mimic the workings of the human nose. To be able to recognize or distinguish one sample to other samples, eNose must be trained first in order to have the memory of samples that are drilled. "How it works is much like the work of a nose. Samples were placed in a tool to get the aroma. The material is heated, the smell of the gas that comes out will be detected by sensor, then analyzed via special software," he said.

Kuwat explained that the research for this tool has been conducted since 2000 and has been trained

to differentiate meat such as pork or non-pork, it is even used to determine whether a female cow is ready for mating or not. "The way the device works is very fast. We will know the result within five minutes, but we will keep developing it so it could be finished in a minute," he said.

In addition, eNose can also be used for the rapid detection of contamination of harmful substances such as formalin in food, expiration date of food products, and *halal* food. Currently, eNose is also being developed for the rapid detection of tuberculosis (TB). "We are working to develop the TB detection and I guess it could be used by health centers and hospitals with a more affordable price," he said.

Meanwhile, another product in the form of a mask for anti-smoke and bacteria using nano fiber or nanofiber materials made with synthetic materials such as polyvinyl alcohol or natural materials, such as chitosan and gelatin with electrospinning machine developed by the research group of nanomaterial UGM. "We have been successful in creating a nano-fiber smoke mask, a tool to separate water from oil," he said.

This study, according to Kuwat, is inspired by the catastrophic forest fires that occurred some time ago. Although still in the development stage, this mask, using natural nanoscale materials, is proved to be capable to filter out bacteria and dust.

Vice-Rector for Research and Community Service, Prof. Dr. Suratman, M.Sc., said that these two innovations will soon be patented for business of excellence at global level. "At least, these findings may provide a solution to the problems of the nation," he concluded.

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