



# THE INSTITUTION OF ENGINEERS, MALAYSIA

Bangunan Ingenieur, Lots 60/62, Jalan 52/4, Peti Surat 223, 46720 Petaling Jaya, Selangor Darul Ehsan  
Tel: 03-79684001/2 Fax: 03-79577678 E-mail: sec@iem.org.my IEM Homepage: http://www.myiem.org.my

## Talk On Conversion of Organic Wastes and Unused Biomass to Valuable Materials and Energy Using Sub-Critical Water

Organised by Chemical Engineering Technical Division  
BEM Approved CPD/ PDP Hours: 2 Ref No: IEM15/HQ/073/T

**Date :** 6 May 2015 (Wednesday)  
**Time :** 5.30 p.m. – 7.30 p.m.  
**Venue :** Auditorium Tan Sri Prof. Chin Fung Kee,  
Third Floor, Wisma IEM, PJ  
**Speaker :** Dr. Hiroyuki Yoshida,  
Universiti Putra Malaysia

### SYNOPSIS

Sub-Critical water is high temperature and high pressure water but lower than those of critical points (647 K, 22.1 MPa). It shows three typical characteristics. Firstly, sub-critical water (sub-CW) has a great hydrolysis power at around 520 K and organic solids quickly decompose into low-molecular-weight valuable materials. Secondly, sub-CW works as a strong solvent and can extract oil almost perfectly at once. Thirdly, when the temperature is higher than about 600 K, hydrolysis power becomes small and pyrolysis power becomes great. The pyrolysis reaction can convert organics to liquid oil (alternative heavy crude oil) and/or solid char.

### BIODATA OF SPEAKERS



Dr. Hiroyuki Yoshida obtained B. Eng. Degree in 1969 and Dr. Eng. in 1977 in Chemical Engineering from Osaka Prefecture University, Japan. He worked for this University from 1974 to 2013. He became a professor in 1995. From 2013, he has been working for Department of Chemical and Environmental Engineering, Faculty of Engineering, UPM as a contract professor. His specialties are ion exchange and adsorption, zero-emission process, sub-critical water technology, and super-heated water vapor carbonization. He was a Leader of “Zero Emission by Forming Networks among Various Production Processes in Different Types of Industry” in a national project (US\$0.79 million, 1997-2000). He was Executive Leader of “Science and Engineering for Water-Assisted Evolution of Valuable Resources and Energy from Organic Wastes”, 21st Center of Excellence Program of Ministry of education, Japan (US\$6 million, 2002-2007). He has about 140 papers of top journals and 60 patents on sub-critical water and adsorption. He was a president of Japan Society of Adsorption (2001-2003) and a vice president of The Society of Chemical Engineers, Japan (2009-2010)

### ANNOUNCEMENTS

- Preferential admission to talk shall be accorded to IEM members (pre-registration and online registration are NOT required). (Telephone and/or fax reservation will NOT be entertained)
- Non-members may also attend the talk and will be charged a registration fee of RM50 and administrative fee of RM15.
- For affiliate members, there will be no registration fee. However, they are requested to produce their membership card as proof of membership. For the list of affiliates, please refer [www.myiem.org.my/content/memorandum\\_of\\_undersanding-469.aspx](http://www.myiem.org.my/content/memorandum_of_undersanding-469.aspx).  
*IEM members who fail to produce their membership cards will be charged a fee of RM25.00.*

### FUNDS FOR IEM BUILDING FUND (WISMA IEM)

- Please be informed that IEM will be charging participants RM15.00 administrative fee for talks organized by IEM. Student members are however exempted.
- The fee would be used for overhead costs, building maintenance expenses as well as to support the purchase of the new building.
- All contributions will be deeply appreciated by IEM.

Your understanding is greatly appreciated.

### CPD HOURS CONFIRMATION

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**Ir. Thayananthan Balakrishnan**  
**Chairman**  
**Chemical Engineering Technical Division, IEM**