P Muthukumar, J Pet Environ Biotechnol 2014, 5:4
http://dx.doi.org/10.4172/2157-7463.S1.006

OMICS Group Conferences
Accelerating Scientific Discovery

2nd World Congress on
Petrochemistry and Chemical Engineering
October 27-29, 2014 Embassy Suites Las Vegas, USA

Development of porous radiant burners for domestic LPG cooking and industrial applications

P Muthukumar
Indian Institute of Technology Guwahati, India

In India and other Asian countries, Liquefied Petroleum Gas (LPG) has been used extensively used as a fuel for domestic cooking as well as large –scale cooking applications. Being the 4th largest LPG consumer, India has been spending huge amount of money for subsidizing the domestic LPG cylinder (14.5 kg) price from $16 to $7. Considering the depletion of fossil fuel resources, environmental issues, and financial burden on the Government of India for subsidizing the domestic LPG price, there is an urgent need to explore the ways for improving the performances of the existing LPG cooking stoves. Tests carried at IIT Guwahati shows that the conventional LPG burners available in the market are having 55-65% thermal efficiency, and high CO and NOx emissions.This presentation briefs about the development of the PRBs used for LPG cooking applications. Performances tests on the PRB have been carried out employing different porous materials, porosities, geometric dimensions, etc. At the operating condition of 0.54 equivalence ratio at 1.3 kW power intensity, the reported maximum thermal efficiency of the 90% porosity SiC based PRB was about 75%. Thermal efficiencies of all the tested burners gradually decrease with increase in the equivalence ratios and power intensities. Optimum porosity of the 90 mm burner was found to be 90%. PRB showed the stable combustion in the equivalence range of 0.52 - 0.65. Emission indices of all PRBs are lower than that of the conventional LPG domestic cooking stoves available in the Indian markets. The radial temperature distribution of the combustion zone was found to be uniform. For large –scale cooking application having the power range of 5 - 10 kW, the measured thermal efficiencies are in the range of 50-55%, which is about 25% higher than the conventional stoves.

Biography

P Muthukumar received PhD degree in Mechanical Engineering from IIT Madras, India during 2005. He joined at IIT Guwahati as Assistant Professor in January 2006 and he became Associate Professor in January 2010. He received DAAD research fellowships four times. He is the recipient of IEI Young Engineer Award - 2010 in Mechanical Engineering from Institute of Engineers (India) and also the recipient of Bhaskara Advanced Solar Energy Fellowship from Indo - U.S. Science and Technology Forum. He is the reviewer of over 30 international journals. He published over 110 research papers in various international journals and conference proceedings and supervised 5 doctoral theses. His area of interests are hydrogen energy storage, metal hydride based thermal machines, medium combustion, sorption heating and cooling systems, etc.

pmuthukkumar@yahoo.com