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Prospect of biofuel in Bangladesh: Bioethanol and biodiesel production at local conditionMohidus Samad Khan¹, Md Mursalin Rahman Khandaker¹, Suman Nandy¹, Anika Ferdous¹, Laila Hossain¹, Samavi Farnush Bint-E-Naser¹, Farid Ahmed¹, John Liton Munshi² and Chapol Kumar Roy²¹Bangladesh University of Engineering and Technology, Bangladesh²BCSIR Laboratories, Bangladesh

In Bangladesh, the demand of fossil fuel has been consistently increasing with the development of its industrial and agriculture sectors. The annual demand of petroleum products in Bangladesh is met primarily by refining imported crude oils from overseas. To meet the future energy demand and to save foreign exchange, it is essential to look for domestically produced renewable fuel sources. Bioethanol from biomass and biodiesel from microalgae could be potential alternate fuels for Bangladesh. Bioethanol, which is generally obtained from the conversion of carbon-based feedstock, is a quasi-renewable energy source. Although Bangladesh does not commercially produce bioethanol till date, there are few initiatives at the private sector in this regard, and therefore, it is important to understand the fuel properties of bioethanol. This study analyzes different fuel properties, namely, specific gravity & API gravity, viscosity, Reid vapor pressure, calorific value, ASTM color, ASTM distillation, copper strip corrosion and water sedimentation, of bioethanol and 5 and 10 percent bioethanol blended with petrol and octane. To make biofuel production from microalgae economically viable and sustainable, it is important to identify microalgae strains with high lipid content and to find an optimized mass culture technique for local condition. This study presents the growth kinetics of microalga *Chlorella vulgaris* grown in Bangladesh, in the parameters of cell count, optical density and dry cell weight cultured in 4 different media, namely CH, BB (Bold's Basal), MLA and CHU (modified). The growth curves obtained from algal growth in all the media were compared with lipid productivity. The extracted lipid was trans-esterified to produce biodiesel and the algal biomass left after lipid extraction was analyzed to quantify protein and other nutrients. This study will be highly useful, providing the baseline properties of locally produced bioethanol and biodiesel as potential alternate fuels for Bangladesh.

Biography

Mohidus Samad Khan is an assistant professor at the Department of Chemical Engineering, Bangladesh University of Engineering and Technology (BUET). He completed his BSc in chemical engineering (2004) from BUET, and Ph.D (2006-10) in bio-surface and biotechnology from Monash University, Australia. He worked as a post-doctoral fellow at the Department of Chemistry, McGill University, Canada to continue his research work on bio-surface engineering (2010-13). Since 2013, He is working as an assistant professor at BUET. He also served as a visiting professor (2015) at McGill University, Canada, and as a visiting research scholar (2016-17) at Texas A&M University, USA.

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