

Abstract Submitted
for the DAMOP15 Meeting of
The American Physical Society

A study of electrochemistry for Pathor Kuchi Leaf (PKL) electricity generation system MD. KAMRUL ALAM KHAN, MD. SHAMSUL ALAM, JESMIN SULTANA, M.A. MAMUN, Jagannath University, Bangladesh — Electrodes are put into the *Bryophyllum Pinnatum* Leaf (BPL) or Pathor Kuchi Leaf (PKL) sap and they produce substantially sufficient amount of electricity to power energy consumed electronics and electrical appliances. The role of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ solution has been studied. The electrical and chemical properties, a very important factor for PKL electricity generation device have been studied in this research work. The electrical properties are: internal resistance, voltage regulation, energy efficiency, pulse performance, self discharge characteristics, discharge characteristics with load, capacity of the PKL cell, temperature characteristics and life cycle of the PKL cell. The chemical properties are: The $[\text{Zn}^{2+}]$, $[\text{Cu}^{2+}]$ and quotient constant. The optimum level of the $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ solution has been studied. The adherent/adherence effect of the electrodes for use in $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ solution have been studied. The performance of the production of the two bi-products (fertilizer and hydrogen gas production) has been studied. Variation of concentration of Zn^{2+} and Cu^{2+} with the variation of percentage of the secondary salt ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$), percentage of the water and the percentage of PKL sap have been studied. The change of PKL power efficiency with time has also been studied. Most of the results have been tabulated and graphically discussed. This study on showed that, internal resistance is nearly 0.60 ohm, voltage regulation is close to 9%, pulse performance is so good and energy efficiency is about 65%. Internal resistance is very much higher than the acceptable range.

Md. Kamrul Alam Khan
Jagannath University, Bangladesh

Date submitted: 09 Jan 2015

Electronic form version 1.4