Rajatava Mukhopadhyay et al., Biosens J 2018, Volume 7
DOI: 10.4172/2090-4967-C1-003

Study on the spontaneous generation of electrostatic potential gradient in an electrolyte due to the presence of a static magnetic field and its applications in construction of analogous voltaic, daniel and concentration cells magnetolysis: An alternative to electrolysisMagnetolysis: An alternative to electrolysis

Rajatava Mukhopadhyay and **Debosmita Pathak**
Jagadis Bose National Science Talent Search, India

Electricity and magnetism were considered as separate identities until late 19th century, when people like Maxwell, Faraday came to the forefront to change the idea.

Classical electromagnetic theory of Maxwell, with the help of certain experiments, disclosed that current electricity and magnetism at two opposite faces of the same coin, that is, they are different approaches to the same aspect of physics. Electromagnetism is one of the most important aspects of physics, since it broke the jinx of classical physics and paved the way to the beginning of research about structure of matter and consequently to the foundation of quantum mechanics.

An electric current can induce a magnetic field, and vice-versa. So, electricity and magnetism should, so to say, be interchangeable, which is the main idea we have tried to implement.

Electrolysis is something we are all familiar with. In electrolysis, electricity flows due to a potential difference developed across the two electrodes of a cell, due to differential reduction potential at the two terminals.

So, can this potential difference be induced using a magnet too?

Surprisingly, yes.

Replacing the cathode and anode of an electrolytic cell with the north and south poles of a magnet (respectively), we get the exact same result as that expected from electrolysis.

Cations get attracted to the north and anions to the south pole. Electrons flow from the south to the north pole through the magnet (analogous to anodeàexternal circuitàcathode) and current from the north to the south, on completing the circuit (for a half-cell setup).

Morever, a magnetolytic cell can be recharged be simply reversing the polarity of the two half-cells, by exchanging the magnetic poles immersed in them.

So, to conclude, lysis and current flow with the help of magnets ---- '*magnetolysis*', maybe a viable, sustainable and economic alternative to electrolysis in the near future. *All practical applications of an electrolytic cell can be realised through an analogous magnetolytic cell.*

All the experimental data, associated graphs and data are stored for future reference.

rajatava.m@gmail.com