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**RECYCLING: REDUCE, REUSE & RECYCLE** November 06-08, 2017 | Las Vegas, USA**Design experiment for bio anode treatment for application in bioelectrochemical system for hydrogen production****Mónica Mejía<sup>1</sup>, Vereá<sup>2</sup>, P J Sebastian<sup>1</sup>, J Campos<sup>1</sup> and A Verde<sup>1</sup>**<sup>1</sup>National Autonomous University of Mexico, México<sup>2</sup>University of Sciences and Arts of Chiapas, México

Obtaining hydrogen by bioelectrochemical system has become very popular in recent years. For optimization of bioelectrochemical system it has been used statistical methods as the design of experiments. Having a design of experiments and optimization methodology is important in current research as it allows through a series of minimum experiments and drawings, find factors affecting the experimental process and essential information to help pinpoint optimization and model mathematical governing the system. The response surface methodology with central composite design was applied to obtain the best condition of anode pretreatment to be used in a bioelectrochemical system. The factors used were electrolyte concentration, applied potential, temperature and treatment time. With the use of the best condition found one  $k_{\text{aap}}$  of  $0.26 \text{ s}^{-1}$   $\alpha$  of 0.35 and a current of 1050  $\mu\text{A}$  was obtained. With this condition uniform biofilm was obtained and produced hydrogen  $Q_{\text{H}_2}=0.19 \text{ m}^3/\text{m}^3\text{d}$ . In addition to the experimental design the mathematical model for this system was found.

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