IMPROVING ELECTROCHEMICAL PRODUCTION OF H_2O_2

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Abstract: Hydrogen peroxide (H_2O_2) production is estimated at 4.7 Mton annually by 2017 and is produced industrially via the anthraquinone autoxidation process. H_2O_2 is used in various applications such as paper and pulp bleaching, textile bleaching, production of chemicals and environmental applications. We have shown that with our electrolyser approach (see Figure 1) ~10% H_2O_2 can be produced, which is sufficient for most applications (~75%); for the production of chemicals typically much higher H_2O_2 concentrations are used. Our latest research focused on reducing costs by increasing space-time yield of hydrogen peroxide and decreasing energy usage. Using more concentrated electrolytes, alternative anion exchange membranes and better electrolyser design we were able to decrease the cell voltage considerably (see Figure 2).

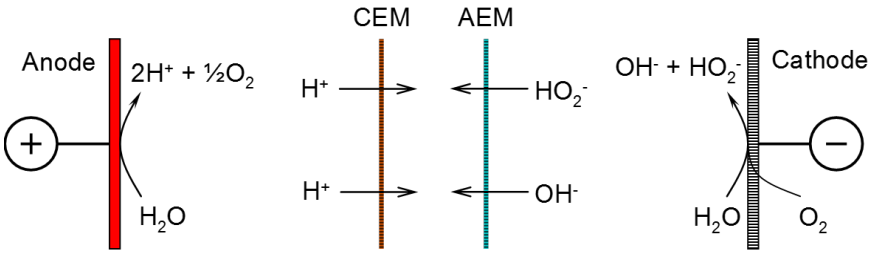

Figure 1: schematic representation of the H_2O_2 electrolyser configuration

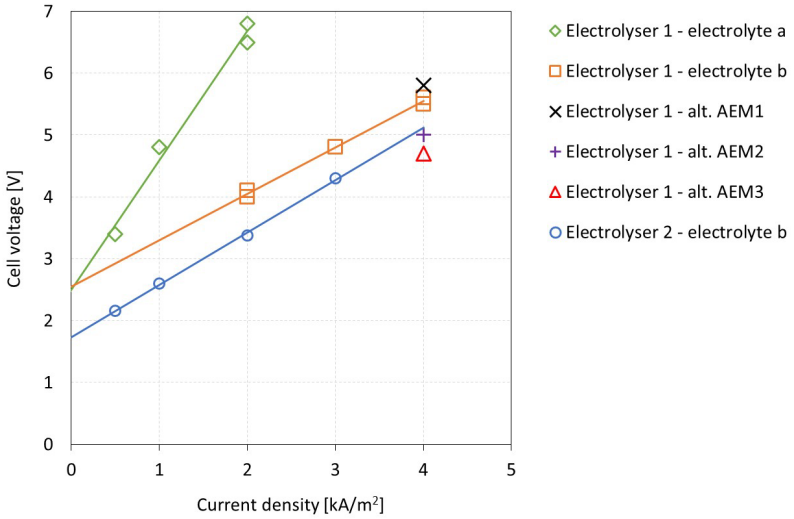

Figure 2: Influence of various parameters on the cell potential