

Improving the electrochemical production of hydrogen peroxide

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Hydrogen peroxide (H₂O₂) production is estimated at 4.7 Mton annually by 2017 and is produced industrially via the anthraquinone autoxidation process. H₂O₂ 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% H₂O₂ can be produced, which is sufficient for most applications (~75%); for the production of chemicals typically much higher H₂O₂ 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).

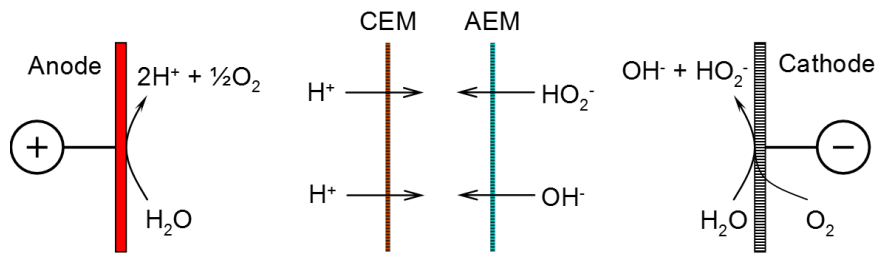


Figure 1: schematic representation of the H₂O₂ electrolyser configuration

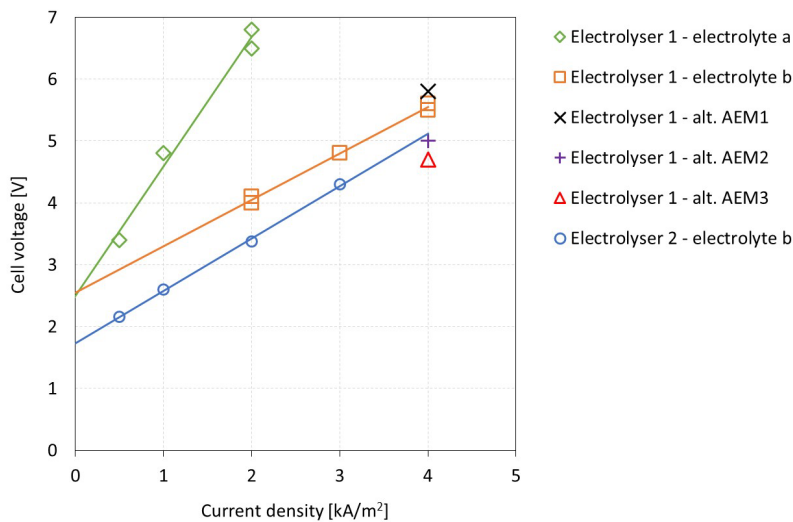


Figure 2: Influence of various parameters on the cell potential