DEVELOPMENT OF POROUS METAL ELECTRODES FOR TUBULAR ELECTROLYZERS

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Main goal: The aim of this research line is to improve performance (energy efficiency) of electrochemical tubular reactors for the production of hydrogen (cathode) or oxygen (anode). Improving performance includes manipulation of the surface composition and porosity of the electrodes, such as creation of hierarchial pore structures. In particular the research aims to gain fundamental knowledge on the effects of gas flowing "inside-out" of the porous structure on the liquid flow patterns inducing mixing in the vicinity of the electrode surface, and how this leads to alleviation of mass transfer limitations.



Cross sectional view of a porous electrode, showing the direction of flow of gas "inside-out"