

Device and method for the flexible use of electricity

Abstract:

An electrolysis cell for chlor-alkali electrolysis, having an anode half-cell, a cathode half-cell and a cation
5 exchange membrane that separates the anode half-cell and the cathode half-cell from one another, an anode arranged in the anode half-cell for evolution of chlorine, an oxygen-consuming electrode arranged in the cathode half-cell as the cathode, a catholyte space which is formed
10 between the cation exchange membrane and the oxygen-consuming cathode, and through which electrolyte flows, a gas space adjoining the oxygen-consuming electrode at a surface facing away from the catholyte space, a conduit for supply of gaseous oxygen to this gas space, a second
15 cathode for generation of hydrogen arranged within the catholyte space and at least one conduit for purging of the gas space with inert gas, enables flexible use of power in a method in which, when power supply is low, the oxygen-consuming electrode is supplied with gaseous oxygen and
20 oxygen is reduced at the oxygen-consuming electrode at a first cell voltage, and when power supply is high, the oxygen-consuming electrode is not supplied with oxygen and hydrogen is generated at the second cathode at a second cell voltage which is higher than the first cell voltage.

25 Figure 1