Storage of Electrical Energy by Converting It into Chemical Energy

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Assignment of Tasks: Austria gets most of its electrical energy from renewable energy sources. These sources have the problem that their energy output is not constant. This is the reason, why the storage of electrical energy is a very important aspect. A possible storage would be to convert electrical energy into chemical energy. This diploma thesis deals mainly with the storage in hydrogen. Furthermore it gives an overview of the main possibilities to store the produced hydrogen. Realization: At the beginning, we informed us about chemical energy storage. As a next step we specialist in electrolysis, methanation, “liquid organic hydrogen carriers” and pressure tanks for hydrogen. Many experiments were made with a fuel cell and with a hoffmann voltameter. After that, we analysed the different options of storing hydrogen. At the end we calculated energy conversion efficiencies and compared the possible ways to store hydrogen. Results: The results of this diploma thesis are a breakdown of the different means to store hydrogen, as well as the comparison of calculation and observation of the pros and cons of the different possibilities. The experiments can help to understand this way of storing energy. This diploma thesis can also be used for information for future projects.