Tutorial on

BATTERIES FOR ELECTRIC AND HYBRID VEHICLES:

STATE OF THE ART, MODELING, TESTING, AGING.

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Abstract

Batteries are often considered to be the main obstacle in the diffusion of Hybrid Electric and Electric Vehicles. Indeed autonomy and lifetime of the vehicle are key points that depend directly on the batteries. The aim of this tutorial is to give a basic up-to-date knowledge about these crucial components.

Different topics which will be presented:

- State of the art of the different batteries for HEVs and EVs
- Electric models of a battery
- Aging phenomena in lithium batteries
- Design of aging tests

Biographies of the Speakers

Sébastien MARTINET, electrochemical engineer with 15 year experience on batteries, a Ph.D. of Polytechnic Institute of Grenoble in Process Engineering in 1999 on Ni-MH Batteries with SAFT. After 1 year work on Li-Ion Safety concerns at SAFT, he integrated CEA-LITEN in 2000 to develop a Li-Ion Prototyping Line. He was in charge of Laboratory of Components for Energy integrating all CEA Li-Ion material and process developments during 4 years up to end 2009. He is now deputy manager of the Department of Electricity and Hydrogen for Transportation in charge of scientific topics.

Serge PELISSIER, passed "aggregation" in Electrical Engineering at "Ecole Normale Superieure de Cachan" (1986) and received his Ph.D. degree in Electrical Engineering in 1990 from the "Institut National Polytechnique de Grenoble". He got a "Habilitation à Diriger des Recherches" at University of St Etienne, where he taught physics and electricity as a Professor until 2007. He joined the French National Institute for Transport and Safety Research (INRETS), to work in the field of electric and hybrid vehicles. His main research interests are modelling of batteries and characterisation of their uses in HEV and EV.

References

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