Material Science Developments Enhancing Excess of Power Reproducibility

V. VIOLANTE, M. BERTOLOTTI, E. CASTAGNA\textsuperscript{1}, M. MCKUBRE\textsuperscript{2}, F. SARTO, C. SIBILIA\textsuperscript{1}, F. TANZELLA\textsuperscript{2}, T. ZILOV\textsuperscript{3}, ENEA Frascati Research Center, Frascati (Italy) — Material science research activities have been carried out in order to increase the reproducibility of the excess of power production during electrochemical loading of palladium with deuterium. In the past a wide work was developed to obtain a metallurgical structure of the palladium able to ensure a significant loading of deuterium above the threshold of 0.95 (D/Pd atomic fraction). It was observed that the high loading of the Pd cathode with deuterium was a necessary condition to have the occurrence of the excess of power production. The more recent work was mainly oriented to optimize the material properties in order to have a significant improvement of the reproducibility of the excess of power. During the last campaign of experiments more than 50\% of the experienced cathodes produced excess of heat ranging from 30\% up to more than 100\% of the input.

\textsuperscript{1}La Sapienza University, Roma Italy
\textsuperscript{2}SRI International Menlo Park
\textsuperscript{3}Energetics Technology, Omer (Israel)