



# 21世紀COE講演会

講演者 Dr. Jörg Ackermann (France)

演 題 Hybrid bulk heterojunction solar cells: a novel approach for flexible photovoltaics

日 時 6月6日 (火) 16:00~17:30

場 所 京都大学桂キャンパス A2棟118号

World demand for energy is projected to more than double by 2050 and to more than triple by the end of the century. Sunlight provides by far the largest of all carbon-neutral energy sources. The challenge in converting sunlight to electricity via photovoltaic solar cells is dramatically reducing the cost/watt of delivered solar electricity — by approximately a factor of 5–10 to compete with fossil and nuclear electricity. Solution processing of polymer organic photovoltaic devices may offer an inexpensive technology for production of solar cells but requires low-cost materials that offer high photovoltaic efficiency and stability. Hybrid solar cells present an interesting alternative to inorganic and all plastic solar cells by combining the advantages of both materials: solution processing of polymer semiconductors and the high electron mobility and stability of inorganic semiconductors. Critical for the development of hybrid solar is the design of new hybrid nanocomposite materials with improved photovoltaic performance and the study photocurrent generation processes at the hybrid heterojunction interface.

In this communication we present a solution processed hybrid bulk heterojunction solar cells based ZnO nanorods as electron acceptor and poly-3-hexylthiophene (P3HT) as electron donor material. Current-tension characteristics and external quantum efficiency analysis (EQE) under vacuum and ambient atmosphere are used to study the photocurrent generation processes in the hybrid nanomaterial. We focus on the influence of ZnO nanorod concentration on the device performance and device stability in ambient atmosphere. Furthermore results on dye-sensitization of ZnO nanorods and their application to hybrid heterojunction solar cells are presented.

問い合わせ先

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