

Preface

The need to replace conventional energies—coal, oil and nuclear power—by alternative ones has been emphasised many times and underlined only recently in the Durban Climate Change Conference. Among these alternatives, photovoltaic devices play a leading role. This book here deals with one important representative, the heterojunction solar cell.

As its name points out, it consists of two different materials, crystalline and amorphous silicon. While the former one was brought to a high standard already shortly after World War II, amorphous silicon was investigated in detail only in 1968, in Romania. In contrast, heterojunction solar cell production of today is a flourishing business as seen by the example of Sanyo or Meyer Burger.

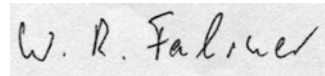
This book deals with some typical properties of the heterojunction cell. Its history, schematic cross-sections, and production tools will be shown. A special chapter is devoted to the challenges of the cell such as texturization, interface defects, passivation, lifetime and surface velocity, epitaxial layer formation, emitter, and back surface field conductivity.

Some important measurement tools are presented.

Today no electronic device will be produced any more before it is not simulated. Thus, we present a few of the simulation programmes available on the market.

The book is completed with a brief survey of the state of the art as represented by the efficiencies.

Because China is the strongest emerging market in the solar cell field a collection of related publications and their discussion appeared to be mandatory.

A handwritten signature in black ink, reading "W. R. Fahrner", with a stylized flourish at the end.

Nanchang, December 2011

Wolfgang Rainer Fahrner

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Solar Cells

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