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Deposition and Characterisation of Crystalline Silicon

By Thomas Rachow

Fraunhofer Verlag Dez 2014, 2014. Taschenbuch. Book Condition: Neu. 24x17x cm. Neuware - The presented thesis will discuss the recent development in the deposition of silicon by atmospheric pressure chemical vapour deposition (APCVD) and the characterisation of these crystalline silicon thin films at Fraunhofer ISE. In the second Chapter a short overview of the process technologies for chemical vapour deposition (CVD) will be given. A general and a simplified model for the silicon deposition will be discussed. Furthermore, the rapid thermal deposition tool and the standard deposition process will be described. This includes the influence of critical process parameters, the mechanism of doping incorporation and the deposition of epitaxial emitters. One main objective of this thesis, the silicon deposition at a temperature from 1100 °C to 850 °C by APCVD, will be described in Chapter 3. The different properties of epitaxial and microcrystalline growth will be identified. A description of the process optimisation and a detailed process characterisation will be given. In the 4th chapter the fundamentals of crystal growth, the formation of crystal defects and the characterisation of these defects, will be used to improve the silicon deposition by APCVD. The focus will be on the crystallographic characterisation by...



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