

<<普适弛豫定律>>

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前言

Fifty years ago, I was sitting in a class at Jiaotong University in Shanghai, China taking a course called "DIELECTRIC PHYSICS" lectured by the late Professor Chen Jidan. I was one of the thirty students sitting in his class taking the course. This was the first time DIELECTRIC study was introduced to Chinese Universities. Since then, dielectric study became one of the major concerns of the science and technology community of China in developing its electrical and electronic engineering. Fifty years past, thousands of students, graduate students, professors, scientists and engineers have been engaged in the studies and applications of dielectrics in this country. In the past fifty years, the Xi'an Jiaotong University, Shanghai Jiaotong University, Electronic Science and Technological University, Shandong University, Zhongshan University, Sichuan University, Nanjing University, Tongji University and the Shanghai Institute of Ceramics, the Beijing Institute of Physics of the Chinese Academy of Sciences were heavily involved in dielectric studies and gave their various contributions to the development of dielectric study in China. Now, China is probably one of the most important countries in dielectric studies among the list of the ex Soviet Union and the United Kingdom. Late Professor Chen was the pioneer and founder of DIELECTRIC studies in China. The staidness, sureness and solemnness of his academic attitude are the invaluable treasure of the Chinese dielectric community. I would like to take the chance of writing this preface to pay my sincere respect to the late Professor Chen.

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内容概要

本书是作者所著《固体中的介电弛豫》一书的姊妹篇，其内容是前作的延续和深化，被电介质领域的许多研究者奉为经典。

作者在对普适介电弛豫进行系统描述的基础上，将其概念外推到其他传统电介质研究不涉及的弛豫过程中。

书中介绍了“普适性”的含义、“平坦”的介电响应和低频介电弥散现象，讨论了半导体中的介电响应，以及发光、化学反应和力学弛豫等非介电过程的弛豫现象，并从理论角度对上述实验现象进行了解释。

本书可作为物理、电子、材料、电气等相关专业的教师、研究生和科研人员的参考书。

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作者简介

A.K.琼克 (A.K.Jonscher, 1922-2005)，生于波兰华沙，1949年在伦敦大学玛丽皇后学院以一级荣誉学士学位毕业，并在该校Harry Tropper教授的指导下于1952年获得博士学位，1951年起在GEC研究实验室工作，从事半导体器件物理原理方面的研究工作，1962年以Reader身份加入伦敦大学切尔西学院，1965年成为固态电子学教授，1987年成为伦敦大学皇家霍洛威与贝德福德斯学院荣誉教授，1990年受邀为IEEE“普适介电响应”杰出怀特海荣誉讲席。

琼克教授在介电弛豫研究方面具有很深的造诣，他于1983年和1996年分别出版的分别出版的学术专著《固体中的介电弛豫》和《普适弛豫定律》，在国际学术界享有盛誉。

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章节摘录

DIELECTRICS AND INSULATOR The use of electrical insulation is as old as the science and technology of electrical phenomena; it goes back at least a century and a half, while the recognition of specifically electrostatic manifestations of electrification goes back to antiquity. Systematic investigations of dielectric properties may be traced back to the 1870's. The accumulated experimental and theoretical material is vast and from an early stage on it was possible to discern two essentially complementary approaches to this wide-ranging subject - the study and development of insulators and of dielectrics. In this classification, insulators are materials used to prevent the flow of current where it is not desired, especially in the context of electrical and electronic engineering, and the principal interest in them lies in achieving the lowest possible electrical conduction coupled with the maximum resistance to destructive breakdown in high electric fields. Other factors such as long life, low cost, chemical inertness and the ability to withstand elevated temperatures may be added to the long list of technical specifications which must be met by modern insulating materials working sometimes under extreme external stresses. It is understandable that engineers and materials scientists searching for insulating materials suitable for specific applications were less concerned with the detailed physical mechanisms governing the behaviour of these materials, provided that their characterisation in terms of clearly defined parameters could be achieved reliably and simply. This order of priorities remains true to this day and the chief emphasis in electrical insulation science falls on the synthesis of materials and their characterisation. By contrast with the insulation aspect, dielectric phenomena are at once more general and more fundamental - after all, insulators are dielectrics - and are concerned more intimately with the microscopic mechanisms of dielectric polarisation and include, especially, the transient behaviour under time-varying electric fields.

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