

Preface

In electromagnetism, a dielectric (or dielectric medium) is an electrical insulator that can be polarised by an applied electric field. When a dielectric material is placed in an electric field, electric charges do not flow through the material as they do in an electrical conductor, because they have no loosely bound, or free, electrons that may drift through the material, but instead they shift, only slightly, from their average equilibrium positions, causing dielectric polarisation. Because of dielectric polarisation, positive charges are displaced in the direction of the field and negative charges shift in the direction opposite to the field. This creates an internal electric field that reduces the overall field within the dielectric itself. If a dielectric is composed of weakly bonded molecules, those molecules not only become polarised, but also reorient so that their symmetry axes align to the field.¹

In the present book, ten typical literatures about dielectric materials published on international authoritative journals were selected to introduce the worldwide newest progress, which contains reviews or original researches on dielectric materials. We hope this book can demonstrate advances in dielectric materials as well as give references to the researchers, students and other related people.

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¹ <https://en.wikipedia.org/wiki/Dielectric>