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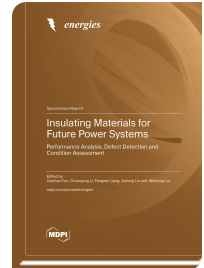
Insulating Materials for Future Power Systems

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A wide variety of electrical materials, including polymeric insulating materials, energy storage materials, functional ceramics, semiconductive sensing materials, and high-conductive metallic materials, comprise the complex power transmission system. Recently, modern renewable energy systems are replacing traditional energy systems due to the more precise and controlled power stations. In this context, insulation materials, as one of the core components in electrical power equipment, will face unprecedented challenges and opportunities that may enhance operational complexity while reducing the power system's safety and reliability.

The variations in operational conditions raise questions about the insulation strength of the numerous ultra-high voltage (UHV) assets that have been newly developed. Consequently, there is an essential need for a credible performance analysis, defect detection, and condition assessment of insulation materials in UHV equipment.

Therefore, in this reprint, we discuss several interesting topics focusing on the fabrication, performance analysis, deterioration mechanisms, defect detection, and condition assessment of new electrical materials.



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