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Sommario/riassunto	This book describes the state-of-the-art use of biological insulating liquids in detail. In recent years, more and more transformers filled with esters have been put into operation. This is because people recognize the benefits of ester liquids in terms of their fire safety (high flash and fire points) and environmental characteristics, judging from their biodegradability, their low CO2 footprint (only valid for natural ester) and their beneficial interactions with solid insulation, etc. One of the main reasons is that the water adsorption and absorption characteristics of these liquids are excellent and very different compared to mineral oil. The today's discussion about climate change and global warming is an additional driver for using natural ester. Another advantage is that transformers filled with biological insulating liquids can operate with an overload of up to 150%. This is advantageous in the case of volatile energy generation from wind and

solar power and in the supply of electrical energy for electromobility. Liquid inside electrical equipment is the lifeblood that serves both as a dielectric and a cooling medium. Some properties of these liquids differ from mineral oil, which had to be considered in the transformer design. The dielectric liquid is always in direct contact with transformer materials; therefore, the interaction should be very well understood, especially when retrofilling an existing mineral oil filled device. There are several natural ester fluids derived from various seeds and fruits on the market, and their properties may differ more or less. In the book, the most important properties of the different biological insulating fluids and mineral oil are compared. Ester fluids have already found their way into various standards. The condition of the device can be verified very well from the contents of the insulating liquids. For analysis and testing, the same equipment and devices that are commonly used for mineral oil are used for ester liquid. The chemical and physical behaviors of ester fluids compared to mineral oil are different. This must always be considered when interpreting test results stemming from ester fluids. The book is a guideline for students, original equipment manufacturers, users, laboratories and authorities in the use of biological insulating liquids.
