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Compliance of Synthetic Fuels with European Standards: The German Regulatory Perspective

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Synthetic fuels are considered key elements for reducing greenhouse gas emissions in the transport sector while maintaining compatibility with existing engines and fuel infrastructure. However, their market introduction depends strongly on compliance with European fuel quality standards and national regulatory frameworks. This work presents an overview of compliance pathways for synthetic fuels within the European standardization system, with particular focus on the German implementation.

The study explores different production pathways for synthetic fuels, including Fischer–Tropsch fuels and methanol-derived fuels, and evaluates their compliance with relevant European fuel standards such as DIN EN 15940 and DIN EN 228. Particular attention is given to physicochemical fuel properties, fuel quality requirements, and regulatory approval procedures.

A comparative analysis of mainly literature-derived fuel property datasets was conducted to assess the compliance of different synthetic fuel pathways with European fuel quality specifications. The study further includes a comparative assessment of key physicochemical properties of fuels produced via the considered production pathway.

The outcomes of the study provide guidance for fuel producers and policymakers to support the broader implementation of synthetic fuels. The study demonstrates that successful market integration of synthetic fuels requires not only greenhouse gas reduction potential, but also strict compliance with physicochemical fuel specifications and regulatory approval pathways.

The presented overview contributes to a better understanding of current regulatory challenges and future opportunities for integrating synthetic fuels into the European fuel market.