

# ***Monitoring of Fuel Hydrofining and Its Valorization through Modeling***

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## **Abstract**

Hydrodesulfurization is a catalytic process by which the deep removal of sulfur- and nitrogen-containing compounds is achieved through the use of hydrogen, in order to stabilize the petroleum product by hydrogenating these compounds and hydrogenating part of the unsaturated hydrocarbons present in it. Usually, in modeling and monitoring problems related to hydrodesulfurization, sulfur compounds, nitrogen compounds, alkenes, and aromatics participating in hydrogenation are considered to have a single, lumped representation. The control and monitoring of diesel hydrotreating processes represent an extremely important system for producing ultra-low sulfur diesel, so as to comply with environmental regulations regarding the use of fossil fuels [1–2]. The structure of the summary similarly follows the structure of the doctoral thesis, in terms of the successive presentation of chapters and subchapters, along with the description of the research carried out in the development of the work. The summary starts from the TABLE OF CONTENTS OF THE THESIS. Beginning with Chapter 2, the approach to the doctoral research presented in the thesis is introduced. Thus, CHAPTER 2 of the summary briefly contains Chapters 1 and 2 of the documentary analysis from the thesis, while the following five chapters (3–7) are described by highlighting the methods and techniques addressed in the scientific research activity carried out during the development of the thesis. The presentation in this summary of Chapters 3–7 also bears similarities to the construction of the thesis; therefore, they are treated accordingly. The general conclusions of the doctoral thesis are included in CHAPTER 3 of the summary and are presented successively by chapters, identically to the presentation in the thesis. The personal contributions of the doctoral thesis are highlighted in CHAPTER 4 of this summary, while the SELECTIVE BIBLIOGRAPHY and the LIST OF PUBLICATIONS conclude the present work condensing the thesis.