

EXERGY LIFE CYCLE ASSESSMENT OF NI-BASED CATALYST SYNTHESIS PROCESSES

Boris Agarski¹, Vesna Nikolić², Zeljko Kamberović³, Zoran Anđić⁴, Borut Kosec⁵, Igor Budak¹

¹ Faculty of Technical Sciences, University of Novi Sad, 6 Trg Dositeja Obradovića, 21000, Novi Sad, Serbia

² Innovation Center of the Faculty of Technology and Metallurgy, University of Belgrade, 4 Karnegijeva Street, 11120, Belgrade, Serbia

³ Faculty of Technology and Metallurgy, University of Belgrade, 4 Karnegijeva Street, 11120, Belgrade, Serbia

⁴ Innovation Center of the Faculty of Chemistry, University of Belgrade, 12-16 Studentski Trg, 11000, Belgrade, Serbia

⁵ Faculty of Natural Sciences and Engineering, University of Ljubljana, 12 Aškerčeva Street, 1000, Ljubljana, Slovenia

Corresponding author e-mail: agarski@uns.ac.rs

Abstract

Within the life cycle assessment, exergy analysis is one of the specific approaches to evaluate impacts on the environment through the quality of energy which is degraded during the production process [1]. Exergy can be described as a measure of resources depletion and it can be used to evaluate the process efficiency. Comparative assessment of product and processes through life cycle assessment is often used to identify the differences and environmental hotspots. This research applies exergy life cycle assessment to compare different Ni-based catalysts synthesis processes. In previous research [2,3] the authors compared novel Ni-Pd/Al₂O₃ catalyst synthesis processes with other ones from environmental and performance point of view. Idea of this research is to calculate the impacts on the environment by the total exergy consumption of Ni-based catalyst processes and to compare these results with the results from previous research. Compared with other Ni-based catalyst synthesis processes, the assessment results confirm the previous findings that the novel Ni-Pd/Al₂O₃ catalyst synthesis process has the smallest environmental impact. Furthermore, exergy life cycle assessment provided insight into impacts on the non-renewable and renewable resources.

References

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