Proceedings of International Scientific-Practical Conference «Sustainable Development Goals: Youth Policy and Innovative Technologies», February 15-16, 2023, Oguz Han Engineering and Technology University of Turkmenistan, Ashgabat, Turkmenistan

MODELING THE CONVERSION PROCESS OF SYNGAS TO METHANOL PRODUCTION

Begench Charyyevich Garahanov*

Oguz Han Engineering and Technology University of Turkmenistan, Ashgabat, Turkmenistan.

*Corresponding author

DoI: https://doi.org/10.5281/zenodo.7776863

Nowadays, when digital technologies are actively developing, the use of computer developments in existing industrial enterprises and production facilities is becoming more and more important. As a result, the relevance of research in the field of creating "Digital twins of industrial production processes" is increasing, which began in the first decade of the 21st century.

The relevance of this work can be justified by its scientific and practical interest. Scientific interest is supported by the fact that, despite the innovation and development of technology in the field of digital twins, the topic of using simulators that can help familiarize students with this direction to the methods of their practical work, remains understudied. As little-studied digital twins themselves, which appeared relatively recently - in the early 2000s [1].

The practical importance of the work lies in the fact that computer simulators created on the basis of digital twins, allow you to simulate a variety of situations that may occur in production. Location of equipment, movement of workers, conducting repair operations, the reaction of devices to changes in various indicators, emergencies - all this can be considered with the help of digital twins [2].

The work aims to develop a virtual space for a digital twin chemical methanol production. Especially, to create a static and dynamic model of this production, the development of its master plan, and building a unified technological line in the virtual space. It is supposed that the structure, according to which the modules will be built, will be universal and can be applied in the future to other digital twins.

In this work, we will investigate the simulation technology of synthesis gas and methanol production processes, as well as methods and means of modeling various chemical-technological apparatuses.

During the research, the intuitive process modeling program Honeywell's UniSim® Design Suite will be used, which helps engineers to create models for plant design, using which the model of synthesis gas production processes in static and dynamic modes will be built and an automated control system of this process will be developed.

In conclusion, with the help of such virtual simulators based on digital twins of real production facilities, employees can fully master the essence of all running processes, get acquainted with the technology, as well as acquire the appropriate qualification, without any threat to the serviceability of equipment and health of employees. Also, the detailed study of such digital twins allows us to work out the qualitative and quantitative characteristics of production, its efficiency, and costs. The creation of digital twins contributes to adequate management of production processes and solving typical problems of enterprises.

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