**Production and Characterization of Diatomite Reinforced**

**MDI Based Composites**

***Zehra Gülten YALÇIN1\* [C:\Users\Abdullah\AppData\Local\Microsoft\Windows\INetCache\Content.Word\ORCID-iD_icon-16x16.gif](https://orcid.org/0000-0001-5460-289X), Mustafa DAĞ1 [C:\Users\Abdullah\AppData\Local\Microsoft\Windows\INetCache\Content.Word\ORCID-iD_icon-16x16.gif](https://orcid.org/0000-0001-9540-3475), Ercan AYDOĞMUŞ2 [C:\Users\Abdullah\AppData\Local\Microsoft\Windows\INetCache\Content.Word\ORCID-iD_icon-16x16.gif](https://orcid.org/0000-0002-1643-2487)***

*1Chemical Engineering,* *Engineering Faculty, Çankırı Karatekin University, Çankırı, Türkiye*

*2Chemical Engineering, Engineering Faculty, Fırat University, Elazığ, Türkiye*

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| **Abstract**    In this study, new composite materials have been improved by commercial polyol and methylene diphenyl diisocyanate (MDI). Diatomite filler in the particle size range of 149 to 74 microns is prepared for composite production as a filler after drying at 105 °C. Diatomite reinforced composites at different ratios by mass (0 %, 1 %, 2 %, 3 %, 4 %, and 5 %) are produced at room temperature under open conditions to the atmosphere. After mixing commercial polyol and diatomite filler at 1000 rpm for 5 minutes, MDI is added to the mixture and chemical reactions take place at 1500 rpm for 90 seconds. After the mixture is poured into standard molds and allowed to cure for 24 hours, necessary tests and analyzes are carried out [1-3]. The chemical bond structure of the synthesized composite is determined by Fourier transform infrared (FTIR) spectroscopy. Besides, the surface morphology and pore structure of the composite are examined by scanning electron microscopy (SEM) [4]. According to the results, it is observed that as the amount of diatomite filler in the composite raises, the number of closed pores increases and the pore diameter decreases. Besides, the rise in the amount of diatomite in the mixture provides an increase in the density of the composite. With the addition of diatomite, the thermal conductivity coefficient of the composite varies between 0.026 W/m·K and 0.039 W/m·K. Diatomite reinforcement increases both Shore D hardness and the thermal conductivity coefficient of the produced composite. Also, thermal degradation experiments of the obtained composites have been carried out in a PID-controlled system in an inert environment between 25 °C and 575 °C. The filler increases the activation energy and thus the thermal stability of the produced composite [5]. |
| Keywords: Composite, Density, Shore D, Thermal Conductivity, Activation Energy |

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