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## PROCEEDINGS BOOK

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**EVALUATION OF RUBBER WASTES IN COMPOSITES****Nimet Ozmeral**

*Konya Technical University, Faculty of Engineering and Natural Sciences, Chemical Engineering Department, Konya, Turkey.,  
ORCID ID: <https://orcid.org/0000-0003-3463-8697>*

**Merve Turkben**

*Selcuk University, Faculty of Engineering, Chemical Engineering Department, Konya, Turkey., ORCID ID: <https://orcid.org/0000-0002-5587-9126>*

**Suheyla Kocaman**

*Konya Technical University, Faculty of Engineering and Natural Sciences, Chemical Engineering Department, Konya, Turkey.,  
ORCID ID: <https://orcid.org/0000-0001-5199-8577>*

**Ulku Soydal**

*Selcuk University, Faculty of Sciences, Biotechnology Department, Konya, Turkey. ORCID ID: <https://orcid.org/0000-0001-8894-3940>*

**Gulnare Ahmetli**

*Konya Technical University, Faculty of Engineering and Natural Sciences, Chemical Engineering Department, Konya, Turkey.,  
ORCID ID: <https://orcid.org/0000-0002-9381-4139>*

**Abstract**

The composition of solid waste is divided into several types, including rubber waste. About 17,000,000 tons of scrap tires are generated in the world every year, and this amount is around 180,000-300,000 tons per year in Turkey. Most of the rubber waste produced comes from automobile, truck, and motorcycle tires. Only 40% of rubber waste is recyclable, excluding energy recovery and landfill applications. In 2018, the amount of rubber waste burned for energy recovery and disposed of in landfills was 7.2% and 3.4%, respectively. Reliable industrial technology and processes are needed to reuse and recycle these wastes. Processed waste can be transformed into cheaper and more sustainable materials. The cycle of producing new tires from used, worn rubber waste increases sustainability. The use of worn tires and scrap tire granules in new products is significantly. It helps reduce the carbon footprint by one-third compared to products made without recycled materials. Using waste tires as filler material to create new composites seems to be one of the most important methods of sustainable management. In this way, it can contribute to the reduction of the waste tire rubber amount after consumption. In this study, two-type of rubber wastes: ground tire rubber (GTR) and ethylene-propylene-diene monomer rubber (EPDM) was used as reinforcement in an epoxy matrix. Bisphenol A-type epoxy resin and its blend with polyurethane-modified epoxy in a 1:1 ratio were used as matrices. The effect of rubber and epoxy matrix type on composites' mechanical properties was investigated. Also, the effect of water sorption and low temperature on mechanical properties was studied.

**Keywords:** epoxy resin, tire waste, EPDM, composite