The Use of Activated Carbon Prepared from Tires Waste Filled with Nano Zinc and Nano Molybdenum to Remove Sulfur from Petroleum Products

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Petroleum demand currently is ongoing, especially with the increase in industrial and construction evolution. Based on statistics, the Kingdom of Saudi Arabia is ranked second worldwide in oil production and reserves. However, the presence of some sulfur in oil derivatives negatively affects the efficiency and the production of petrochemicals, while increasing costs. This research project aims to achieve the largest amount of production at the lowest cost by using activated carbon from tire waste. Statistics confirm that over 250 million tires put to waste each year in the United States alone. Active carbon prepared from non-dissolving waste will be used in the removal process, In this research, the active carbon will be prepared once by filling it with zinc nanoparticles and another with Molybdenum nanoparticles, then with a mixture of both. After that characterization is done using scanning electron microscopy (SEM) and energy dispersive X-ray spectroscopy (EDX). Activated carbon is then mixed with oil derivatives and extract samples, followed by measurement of the concentration of sulfur compounds using the chromatography separation process. Gaseous (GC), the material consisting of zinc and molybdenum with activated carbon prepared from tire waste, had a high efficiency in removing sulfur from petroleum products, up to 98%. The use of environmental waste contributes to reducing environmental pollution with good efficiency and fruitful results, thus achieving an economic return. And environmental benefits are possible using this process around the globe in the future.

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