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Are Biodiesel Emissions Safer Than Commercial Diesel Emissions?

Since diesel exhaust from millions of cars across the globe releases toxins into the atmosphere, this experiment was designed to compare the emissions of conventional diesel to those of an increasingly popular alternative fuel biodiesel. Carbon monoxide (CO), a toxic gas, sulfur dioxide (SO₂), a contributor to corrosive acid rain, and particulates, detrimental to health in other ways, were measured in the emissions of two commercial diesel fuels and three biodiesel fuels, one of which was homemade from new vegetable oil. It was hypothesized that homemade biodiesel emissions would contain the lowest concentration of toxins, waste-oil biodiesel would have slightly more, and diesel would have much more. Homemade biodiesel was produced through the process of transesterification, and then all five fuels were burned in the same diesel engine of a Kubota tractor. Each exhaust was drawn through gas detector tubes, and coffee filters were held in each exhaust stream for one minute. The concentrations of each toxin were analyzed and recorded. These results showed that, contrary to the prior hypothesis, all emissions tested were similar in their concentrations of toxins, regardless of fuel source. The filters all showed small amounts of particulates, and the concentrations of CO and SO₂ were nearly the same. The results and analysis of this data indicate that, inconsistent with initial research, diesel emissions have low concentrations of the harmful pollutants CO and SO₂; but also that, backing up earlier reading, biodiesel exhaust has low concentrations of the analyzed toxins.