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Testing the Effects Of Gasoline, E-85 Gasoline Mix, And 2,5-Dimethylfuran On Saccharomyces cerevisiae

The purpose of this investigation was to test the effects of three hydrocarbon liquid fuels. Conventional gasoline, 2,5-dimethylfuran, and E-85 were tested against *Saccharomyces cerevisiae* (bakers yeast) to obtain possible environmental impacts. 2,5-dimethylfuran and E-85 are possible liquid fuel alternatives. In the first of seven experiments, plates of yeast cells were treated directly with the three liquid fuels. Every plate grew normally, because the treatments had evaporated. Next, yeast cells were treated with filter paper squares impregnated with the three fuels. Cell growth was normal, but no cells grew underneath the filter paper. The filter paper held the treatment long enough to affect cell death, and the lawn of cells did not. The third experiment sealed the system, and directly treated cells in Parafilm sealed Petri dishes. Closing the system did not effect cell growth, and effectively trapped the treatment. All treated cells died. Next, a growth experiment was developed to determine a range for the lethal doses of each fuel. E-85 was found to have a lethal dose between .1 and 1 mL. The fifth and sixth experiments were broth inoculations, and provided evidence that the lethal doses for gasoline and 2,5-dimethylfuran were .04 and .02 mL in 20 mL respectively, or 1 part-per-thousand and 2 parts-per-thousand. The final experiment found the time frame for DMF treated cell death at between thirty minutes and one hour. The results provided evidence that DMF was the most toxic substance, followed by gasoline, and the E-85 gasoline mix was the least toxic.