CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
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Project Number
31823

Project Title
The Viscosity of Motor Oil

Abstract

Objectives/Goals
Calculate the density of the different motor oils.
Record the temperature and how it affects the viscosity of the motor oils.

Methods/Materials
The motor oils that were used in my experiment were 5W-30, 10W-40, 20W-50. Marbles were used to measure the oil's velocity and density. Temperature readings were done by thermometers and timing was done using a stopwatch.

The oils were placed in graduated cylinders and marbles were dropped in the cylinder. This was done four times at 20°C, 0°C, and 70°C. The different variables that were used to solve for viscosity are density, volume, and velocity.

Results
The higher the SAE rating the slower the speed of the marble. The data revealed that the oil that had a higher grade was more viscous. My findings were that 5W-30 had a viscosity of -150.3 g/cm3 at 0°C. At room temperature, which is 20°C, the marble moved at a medium rate. When the oil was cooled, the marble fell at a very slow rate. The heated oil was very thin like water. The marble fell through the heated oil in less than a second.

Conclusions/Discussion
I found that the different types of oil such as 5W-30, 10W-40, and 20W-50 differ in their viscosity. I believe that the 20W-50 oil would be beneficial if used in cars or trucks with big engines. The 10W-40 oil would be better if used in cars with midsized engines. 5W-30 oil would be good if used in small engines. The way that you would apply this to your everyday life would be to use a combination of your knowledge about the SAE ratings and knowledge about the viscosity levels to determine what grade of oil will be best used in different types of engines.

Summary Statement
My project tests the viscosity or resistance that oil places on the parts of your car's engine at three different temperatures.

Help Received
Parents helped buy the materials; Chemistry teacher, Dr. Castillo helped with the experiment and helped me put together my abstract.