



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Shiri Yadlin	Project Number S1620
Project Title The Effect of Combining Organic Compounds with Differing Numbers of Hydroxyl Groups on Each Mixture's Viscosity	
Objectives/Goals The purpose of the experiment was to discover the relationship between the viscosity of a pure substance and the viscosity of a mixture containing that substance.	
Abstract	
Methods/Materials 1)Ball-drop apparatus constructed 2)Sphere massed 3)Radius of sphere measured 4)Apparatus tube filled with 250 mL glycerin 5)Sphere was dropped to fall through glycerin, a distance of 50 cm 6)Time taken for ball to drop recorded 7)Liquid emptied from tube into bowl 8)Tube refilled and process repeated until 10 values were recorded 9)Instruments cleaned thoroughly 10)Process repeated for ethylene glycol and propanol 11)125 mL Glycerin was mixed with 125 mL ethylene glycol 12)Mixture was poured into the apparatus 13)Same test conducted to obtain 10 values for mixture viscosity 14)Process repeated for ethylene glycol/propanol mixture and propanol/glycerin mixture (all mixtures were 125 mL: 125 mL) 15)All instruments cleaned and dried 16)Calculations conducted to determine viscosity values	
Results It was determined that the mean value for viscosity of propanol was 4.51 P. The calculations for ethylene glycol showed a mean of 8.065 P. For glycerin, the calculated viscosity had a mean of 253.7 P. The ethylene glycol-glycerin mixture had viscosity of 21.67 P, while glycerin-propanol mixture's viscosity values was calculated to be 15.31 P. Finally, the mean viscosity of the propanol-ethylene glycol mixture was 6.111 P, ranging from 5.530 P to 6.530 P.	
Conclusions/Discussion It was found that the propanol was the least viscous liquid followed fairly closely by ethylene glycol and with glycerin being the most viscous by far. Viscosities of the mixtures of the liquids, contrary to the hypothesis, were found not to be equal to the weighted average of the viscosities of the two liquids	
Summary Statement This project investigated the relationship between the viscosity of a pure substance and the viscosity of a mixture of multiple similar substances containing the original substance.	
Help Received Mentored by science teacher	