# Fracking a Safer Way: A Novel Analysis of Potential Innocuous Alternatives for Chemical Compounds Currently Utilized in Hydraulic Fracturing Fluid, Year Two

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During the previous year’s experimentation, it was found that both honey and propylene glycol (two safe ingredients) showed significant signs of being able to replace methanol and ethylene glycol (two potentially harmful substances). In this experiment, two questions will be answered. First, can another replacement to methanol besides honey be efficient in inhibiting acid corrosion of a steel sample? Second, can honey and propylene glycol coexist in the same mixture without one ingredient hindering the effects of another? By combining honey and propylene glycol into one solution and examining the function of each ingredient when exposed to the other, and by comparing the corrosion inhibition of a green produce mix with honey, the hypothesis that harmful ingredients in hydraulic fracturing fluid can be replaced by less harmful ingredients will be further tested. The capabilities of each of these ingredients were analyzed based on data from previous experimentation. After experimentation, it was proven that honey and propylene glycol can coexist in a single fluid without losing their function significantly, and that honey can be effectively replaced by a mixture of various green produce ingredients. A fluid of honey and propylene glycol had no difference in speed when compared to just propylene glycol, and the same fluid was able to inhibit corrosion as efficiently as honey was. In addition, the green produce mixture was able to inhibit corrosion with the same effectiveness that honey shows. Both of these results show significant progress towards the goal of creating a sustainable, clean, fracking fluid.

**Awards Won:**