High Performance Liquid Chromatography (HPLC) is one of the most widely used analytical techniques in the world. Unfortunately, its operation almost always involves the use of hazardous solvents. In this paper, we investigate the use of food grade ethanol as an alternative mobile phase in reversed phase HPLC. Ethanol is renewable, non-toxic, and environmentally benign, especially when compared to the predominant mobile phases in use today like methanol and acetonitrile (methyl cyanide). Ethanol mobile phase will also facilitate the use of HPLC in chemical-free environments, such as schools and seminar facilities.

Environmentally friendly is one thing, but does ethanol work as a mobile phase? In order to properly answer that question, we had to develop criteria for judging mobile phase usefulness or “goodness.” We measured the column pressure in order to determine the relative viscosities and the UV absorption in order to determine the UV cutoffs. We also measured some chemical properties including the selectivity (α) in order to determine if the three solvents have differing chemistries and the retention factor (k) to determine their relative strengths as reversed phase solvents.

Food grade ethanol is a viable mobile phase for HPLC analyses, producing comparable results to both acetonitrile and methanol.

Advantages
- Ethanol is non-toxic and readily available, reducing the exposure hazard as well as the disposal issues.
- Ethanol seems to be a stronger mobile phase in the reversed phase mode, requiring less organic solvent.
- Ethanol yielded similar results to the traditional methanol and acetonitrile mobile phases.

Disadvantages
- Ethanol is higher viscosity than both methanol and acetonitrile, leading to higher pressures. This pressure issue can be mitigated through the use of elevated temperatures.

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