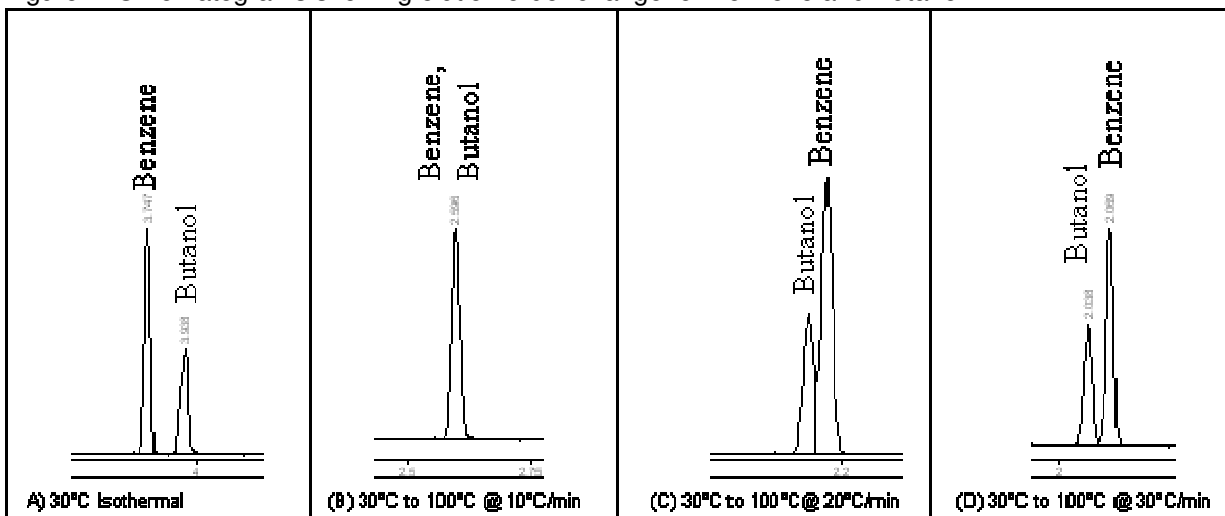


KORY'S GC TECK-TIPS

Compound Elution Order

When using GC, compound elution order is primarily determined by boiling point. In general, compounds with lower boiling points elute earlier than compounds with higher boiling points. However, occasionally a higher boiling point compound will elute before a lower boiling point compound. The reason for the unexpected elution order is that the lower boiling point compound has more interaction with the stationary phase – increasing retention.

Figure 1. Chromatograms showing elution order change for Benzene and Butanol



As demonstrated in Figure 1, an "out of boiling point order elution" will only occur under certain conditions. E.g. under 30 °C isothermal conditions, benzene (boiling point of 80 °C) elutes before butanol (boiling point of 117 °C) on the ZB-5MSi stationary phase. Whereas, with a 30 °C temperature ramp butanol elutes first. Under the conditions of a fast temperature ramp, the separation due to boiling point is minimized because both compounds are volatilized very quickly. This leaves polarity and molecular interactions to retain the molecules.

Since the elution order of compounds can change based upon the oven program, it is important to double check peak identities after a significant change in the GC oven parameters.