Discussion:

Starting with graph 109, I was able to deduce that the molecule represented by the IR was Carvone. I initially decided to look for any indications of acids, such as a broad valley in the range of 2500 – 3500 cm­­-1. I then decided to look for any indications of an alcohol (only alcohol as there were no amines or alkynes on this worksheet) by looking for any valleys above 3000 cm-1. No indication for either the acid or alcohol were shown, so immediately 7 of the choices were out. I then looked at the peeks above and below 3000 cm-1, indicating the molecule had to have both sp2 and sp3 carbons, so both 9-fluorennone and Benzil were not options anymore. Finally, I looked at the peak at 1713, which fell in the range indicating a keytone. Carvone was the only molecule matching this description.

With the graph 005, I was able to deduce that the molecule represented by the IR was 4-Cyclohexene-1,2-dicarboxylic acid. I immediately noticed the broad valley in the range of 2500 – 3500 cm-1, so I knew the molecule had to be an acid, knocking out 7 of the choices. I then looked to at the peaks after 3000 cm-1 indicating sp3 carbons, also knocking out p-Nitrobenzoic Acid and Salicylic Acid. Finally, I narrowed my choices between palmitic acid and 4-Cyclohexene-1,2-dicarboxylic acid. The structure of palmitic acid contained many sp3 carbons, so I would have expected the graph of it to contain much steeper and more peeks lower than 3000, though this graph only contained a few minor peeks. Due to that lack of them, I took an educated guess and concluded that this graph was for 4-Cyclohexene-1,2-dicarboxylic acid.

Conclusion:

The overall basis of this lab was pretty straight forward. We were able to analyze IR graphs and identify certain molecules. We accomplished this by noticing patterns that some functional groups give us on the graph. By process of elimination, we were able to minimize our choices and then make an educated guess as to what molecule the graph represents. My two graphs were labelled 005 and 109, and the molecules they were identified as were 4-Cyclohexene-1,2-dicarboxylic acid and Carvone respectively.