**Calculations:**

* Mass of 50:50(benzoic acid: phenanthrene by weight) = 0.5010g
  + = 0.2505g
    - Thus, theoretically, 0.2505g of phenanthrene mix and 0.2505g of benzoic acid should be in the sample.
* Mass of precipitate from aqueous solution (Benzoic acid + salt + impurities) = 0.1670g
  + Percentage recovered:
    - = 66.67% of benzoic acid
  + Melting point range of precipitate from aqueous solution =121.0 – 122.5C
* Mass of precipitate from the organic solution (Phenanthrene + impurities) = 0.1110g
  + Percentage recovered:
    - = 44.31% of phenanthrene recovered.
  + Melting point range of precipitate from organic solution =98.01 -101.1C

**Discussion and Results**

The main purpose of this lab experiment was to separate benzoic acid and phenanthrene and then extract them. This was achieved through a separation technique using the separatory funnel. Benzoic acid was separated and was found to weigh 0.1670 g and Phenanthrene was found to weigh 0.1110 g; while the initial mass of the 50:50 (benzoic acid: phenanthrene) was found to weigh 0.5010 g. This meant that the % yield for Benzoic acid was to be 66.67% (more than half, not terrible) and the phenanthrene to be 44.31% (less than half, due to errors/limitations).

In order to determine whether the compounds extracted displayed purity or impurity, a melting point test had to be done with both compounds. The melting points displayed that the compounds were in fact pure with very slight impurity; phenanthrene had a range of 98.01-101.1C (with a literature value of 101 C m.p), which was less than 2 degree of the literature value, and benzoic acid had a range of 121.0-122.5C (with a literature value of 122.41 C m.p), which was less than 2 degree of the literature value. Hence, both compounds were pure with, probably, a very slight touch of impurity.

According to my expectations, the percent yield was very low for both compounds 66.67%(Benzoic Acid) and the other being 44.31% (Phenanthrene), this could be due to the fact that the original sample, even though it contained 50:50 of each compound, the benzoic acid and phenanthrene might’ve had impurities, which due to the filtration/separations, the impurities could’ve been separated from the purified compound (according to the melting point test).

An obvious limitation could be the vacuum filtration of phenanthrene. It took a lot of time in order to pressurize the solution in order to take out the precipitate, even with the help of a hot plate. However, this might’ve made it even closer to being perfectly pure.

The two compounds were separated and were tested for their purity, in other words, the main purpose of this experiment was achieved.