Solution

The perpetrator is Franklin Edward Sparrow (aka "Iron (II) Sulfide")

Clue 1: The flask contains two substances, liquid Potassium Carbonate (K_2CO_3) and an unknown solid that are the products of a chemical reaction. The note suggests that the precipitate is important, so this mystery substance is the perpetrator's "calling card" **Clue 2:** The "calling card" is a compound that shares the same initials as the suspect **Clue 3:** The list of suspects can be narrowed down to 4. The atomic number of the elements listed on the slip of paper suggests that the ID must begin with "827" **Clue 4:** The only equation that does not have an error is the second one, suggesting that the perpetrator used a double replacement reaction to make the "calling card" **Clue 5:** The only metals higher than Calcium on the activity series are Lithium (Li), Potassium (K), and Strontium (Sr). Of these, only Potassium (K) is missing so the single replacement reaction creates Potassium Sulfide (K_2S)

Clue 6: The secret ingredient represented by the picture is Iron (II) Carbonate ($FeCO_3$)

 $K_2S + FeCO_3 \rightarrow K_2CO_3 + FeS$