Rates of Bromination Lab

Objective:
To determine the rates of bromination of a series of organic compounds and relate it to chemical structure.

Theory:
You should discuss the following in your theory section:
Radical Reactions
Stability of alkyl radicals
Radical Brominations
Selectivity in radical brominations
Rates of radical brominations
Predictions of the order of rates for the lab. (which will occur the fastest, next fastest, etc)
List each of the reactions to be done with possible products (note: you will not add a Br to an aromatic ring!)

Reagents Used:
Methylene Chloride
Bromine
Toluene
Ethylbenzene
Isopropylbenzene
t-butylbenzene
Cyclohexane
Methylcyclohexane

Procedure:
1. Prepare 6 small test tubes with 0.1 mL of hydrocarbon in 0.5 mL of carbon tetrachloride. Make sure to label you test tubes!!

2. Place 0.2 mL of the 1 M Bromine solution in 7 other test tubes. To one of these 7 test tubes, add 0.5 mL of carbon tetrachloride and label it as the control.

3. Add the solutions of hydrocarbons (from 1) to the 6 remaining test tubes (from 2) and mix

4. Note and record the time of mixing and the time for the reddish brown coloring to disappear.

5. If color remains for 15 minutes, place the test tube into a break of warm/boiling water.

6. Determine the relative order of reactivity from the most reactive (shortest time for color to disappear) to the least reactive (longest time for color to disappear).

7. Do at least two trials.
**Results/Data:**
This section should contain you raw data. You could easily put in a table labeled as “Reaction Times.” You could list the hydrocarbons in the left column then put the time it took for the color to disappear in trail 1 in the next column and the time it took for trial to in the next column. It wouldn’t be a bad idea to include a fourth column with the average time.

You should also include a simple reactivity series in this section.
Ex.
Reactivity series
Compound 1 > Compound 4 > Compound 2 > Compound 3

**Conclusions:**
This section should include:
The reactivity series in paragraph form.
Possible explanations for the reactivity series you found
How did it correspond to the one you predicted in the Theory Section?
What are some possible reasons for them being different, if they are?
What were some possible errors in the lab?

**References:**
Include any references you may have used, including internet sites.