**Rubric for Friedel Crafts alkylation of benzene to 1,4-ditertbutyl benzene mechanism theory 30 pts**

**\_\_\_\_/3 Introduction: Brief overview of over all reaction**

**Step 1: Lewis acid formation (and why)**

\_\_\_\_/2 Coherent, brief explanation of need for unusually powerful Lewis acid (benzene very stable)

\_\_\_\_\_/3 Explanation with pix of how this Lewis acid is formed . Use electron pushing notation.

**Step 2: Initial electrophilic aromatic attack to form t-butylbenzene**

\_\_\_ /6 Clear explanation with pix for how Lewis acid disrupts the aromatic ring. Electron pushing protocol is strongly suggested

It is suggested that you use static Kekule resonance structures which provide specific images of how (+) charge migrates around disrupted ring.

\_\_\_/4 Clear explanation with pix of how H is expelled and initial t-butyl benzene is formed.

Again, electron pushing model is preferred

**Step 3: Regeneration of AlCl3 catalyst**

\_\_\_\_/2 you should explain how HCl is generated and AlCl3 catalyst is regenerated

**Step 4: o,p Directed attack to form 1,2 or 1,4-ditertbutyl benzene (o,p directing)**

\_\_\_ /5 explanation with pix of how activating t-butyl group on benzene produces o and p

direction in interrupted ring (this is why the static Kekule structures are preferred above). Electron pushing should remain the mode of explanation

\_\_\_ /3 explanation of why 1,4-ditertbutylbenzene is favored

\_\_\_/ 2 Workmanship: spelling, English, legibility and other garden variety measures of a good report will be scrutinzed