Grading rubric check list for Butyl bromide synthesis **theory**

***SN2 mechanism of reaction of n-butanol with Br- to form n-butyl bromide***

**step 0** **Protonation of alcohol** \_\_\_\_/15

* **protonation is equilibrium \_\_\_4**
* **shifts right with reflux, H+ \_\_\_3**
* **H+ is from H2SO4 which forms HBr \_\_\_3**

**H+ consumed and is formally from HBr**

**….protonated alcohol is what `attracts’ Br- \_\_\_5**

**step 1** **formation of 5-coordinate complex and ejection of H2O \_\_\_\_/36**

* + - * **which is nucleophile ? (Br-) and why ? \_\_/3**
        + **explain *notion of rate limiting \_\_/5***
        + ***bimolecularity (why SN2) \_\_/5***
        + ***electron motion (curved arrow pix with lone pairs) \_\_\_/6***
        + ***5-coordinate activation state pix & description \_\_/4***

***(inversion)***

* + - * + ***5 coordination is non-lewis and accounts for \_\_/6***

***high barrier***

* + - * + ***leaving group and role of solvent \_\_/4***
        + ***rearrangements ? (none…why not ?) \_\_/3***

**text and diagrams are closely linked/ diagrams well-labeled \_\_/12**

**Workmanship**  \_\_\_/12

neatness, English (grammar, spelling, tense…) aptness of phrasing and description, evidence of effort

total \_\_\_\_\_/75

Grading rubric check list for Butyl bromide synthesis **theory**

***SN2 mechanism of reaction of n-butanol with Br- to form n-butyl bromide***

**step 0** **Protonation of alcohol** \_\_\_\_/15

* **protonation is equilibrium \_\_\_4**
* **shifts right with reflux, H+ \_\_\_3**
* **H+ is from H2SO4 which forms HBr \_\_\_3**

**H+ consumed and is formally from HBr**

**….protonated alcohol is what `attracts’ Br- \_\_\_5**

**step 1** **formation of 5-coordinate complex and ejection of H2O \_\_\_\_/36**

* + - * **which is nucleophile ? (Br-) and why ? \_\_/3**
        + **explain *notion of rate limiting \_\_/5***
        + ***bimolecularity (why SN2) \_\_/5***
        + ***electron motion (curved arrow pix with lone pairs) \_\_\_/6***
        + ***5-coordinate activation state pix & description \_\_/4***

***(inversion)***

* + - * + ***5 coordination is non-lewis and accounts for \_\_/6***

***high barrier***

* + - * + ***leaving group and role of solvent \_\_/4***
        + ***rearrangements ? (none…why not ?) \_\_/3***

**text and diagrams are closely linked/ diagrams well-labeled \_\_/12**

**Workmanship**  \_\_\_/12

neatness, English (grammar, spelling, tense…) aptness of phrasing and description, evidence of effort

total \_\_\_\_\_/75