A Highly Abbreviated Synthesis of Pentalenene by Means of the Squarate Ester Cascade

Problem:

1. Propose a mechanism for the formation of 2 starting from Squarate (1). (Hints: Allene intermediate, Aldol reaction)

2. Propose conditions A and B (1 step).

1.

2.

3. after overnight reaction NH₄Cl

5. 84%

6. 89%

7. 95%

8. 80%

Pentalenene 72%
Solution:

\[
\begin{align*}
1. & \quad \text{Li, NH}_3 (\text{MeOH}) \\
2. & \quad \text{Li, NH}_3 (\text{Et}_2\text{O})
\end{align*}
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References: