1. Draw the unknown products. Provide a mechanism for the formation of D. (Named reaction)


2. Draw product A, then provide a reasonable mechanism for the formation of B.

3. Provide a mechanism for the formation of unknown intermediate B and homologated product C.

![Chemical structure and mechanism](image)

4. With C in hand, you are tasked to synthesize compound D, a precursor to the cortistatin family of natural products. You find 5 g of Bromide E in your neighbor’s fridge. Plan a synthesis using an organometallic strategy. (The authors accomplished this transformation in 4 steps)

![Chemical structure and mechanism](image)

5. Provide a reasonable mechanism for the formation of dihydro-benzofuran B.

![Mechanism for the formation of dihydro-benzofuran B](image)


6. In an attempt to synthesize the *tritwistane* framework, treatment of A with *m*-CPBA led to the formation of compound B with alternative connectivity. Identify compound B using the data given and draw a mechanism for its formation.

![Mechanism for the formation of tritwistane](image)