Aryne’t You Doubly Impressed with this Cyclopropenone Insertion?

Selected examples:

- 

  80% yield, 30 °C, 24 h

  ![Example 1](image1)

- 

  78% yield, 30 °C, 24 h

  ![Example 2](image2)

- 

  0% yield

  ![Example 3](image3)

- 

  56% yield, 30 °C, 24 h

  ![Example 4](image4)

**Xanthylum triflate formation:**

- 

  ![Xanthylum Triflate](image5)

**Significance:** The authors demonstrate a method to formally insert two aryne units into the carbon–oxygen double bond of a ketone, producing spirocyclic xanthene–cyclopropene scaffolds 1. Mechanistically, a direct formal [2+2] cycladdition of an aryne with cyclopropenone is followed by the subsequent cycladdition of the ortho-quinone methide intermediate with the second aryne equivalent.

**Comment:** The reaction relies on the strong nucleophilicity of the ketone oxygen: cyclopropenone proved to be one of the best candidates due to its zwitterionic structure, and attempts to generalize the reaction with other ketones failed. Interestingly, the more electron-rich aryne precursor, when exposed to trace acid, ring-opened to produce xanthylum triflate 2.