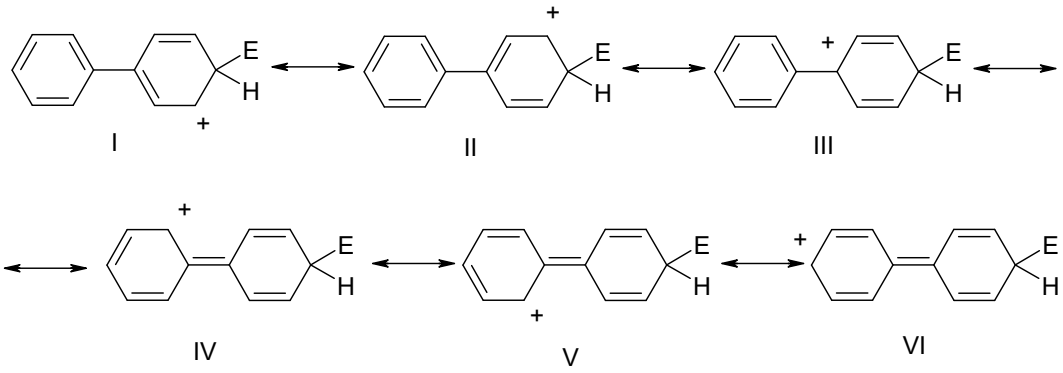
Answer on Question #72035, Chemistry / Organic Chemistry

Question:

Phenyl group is known to exert negative inductive effect but each phenyl ring in biphenyl is more reactive than benzene towards electrophilic substitution. Why?

Answer:

After the attack of an electrophile, the intermediate complex is shown below:



As you can see, structures IV, V and VI are helping to stabilize the intermediate cation due to mesomeric effect.

By the other side, structure III shows that in this case Phenyl group has positive inductive effect for stabilization of the **cation**.

(And you are right, for the neutral molecules Phenyl group shows negative inductive effect).