

## Chapter Four

### 4. Discussion and conclusion

#### 4.1 Discussion

The designed compounds were prepared as mentioned earlier in the synthesis of 2-(prop-2-yn-1-yl)-2,3,3a,4,7,7a-hexahydro-1H-isoindole-1,3-dione (AM). AM was generated through nucleophilic displacement of the bromine located at 3-bromoprop-1-yne. The mannich reaction of 2-(prop-2-yn-1-yl)-2,3,3a,4,7,7a-hexahydro-1H-isoindole-1,3-dione(AM) with paraformaldehyde, appropriate cyclic amine and catalytic amount of cuprous chloride, generate the desired compounds (AM1-AM6). The structures were verified through IR, <sup>1</sup>H-NMR, as illustrate in chapter three. Elemental analysis for some compounds were consistent with the assigned structures.

The proposed mechanism for mannich reaction is outlined in figure 4.1.

In order for mannich reaction to proceed, a reactive immonium cations intermediates should be formed from the condensation of the formaldehyde and the appropriate amines (Shiff base formation). The attack of the carbanion in 2-(prop-2-yn-1-yl)-2,3,3a,4,7,7a-hexahydro-1H-isoindole-1,3-dione cuprous salt on the Schiff base; generates the desired mannich products (AM1-AM6), (Fig 4.1).