

SYNTHESIS AND CHARACTERIZATION OF DI-AZADIBORETIDINE COMPLEXES WITH TUNGSTON(0)

Bakhtiar Muhammad

Deptt of Chemistry, Gomal University D.I.Khan

ABSTRACT

The complexes of cyclobutadiene homologue, founnumbered heterocyclic ring "Diaza diboretidines" $[R'B=NR]_2$ $R'=Et, Pr, Bu$ $R=t-Bu$ with irradiated tungston hexacarbonvis in THF/toluene has been synthesized in good yield and were characterised by spectroscopic methods and elemental analysis.

INTRODUCTION

In our previous article the synthesis of diaza diboretidines have been reported by different methods [1,2]. This paper deals with complex chemistry of diaza-diboretidine, being isostuctural and isoelectronic with cyclobutadiene in which the carbon atoms are substituted by boron and nitrogen atoms. The cyclobutadiene being a highly reactive diene as well as strong dienophile, will readily undergoes Diels Alder cycloaddition with itself and is therefore unstable. The same is true for its derivatives unless the ring ligands exhibits steric and electronic effect, for example sterically overcrowded tetra tert-butyl cyclobutadiene is rather stable substance with nonplaner skeleton. Four ring ligands with clockwise opposed electronic effect define so called push and full cyclobuiadiene which is stable at rt. The ring skeleton is rhombic instead of rectangular with an angle of 87.2° at the carbon atom that bear the $-COOEt$ group [3].

In the homologue of B-N four member ring system "Diaza diboretidines" the ring atoms themselves not the ligand push and pull the electrons. Like its carbon homologue, the tetra-tertbutyl derivatives shows slight deviation from the planar structure, but DADB with sterically less outstanding ligand have a planar rhombic structure comparable to push pull cyclobutadiene.

The complex chemistry of cyclobutadiene have been extensively studied by many research groups [4], while DADB is an infant boron heterocyde and and no much work has been done in this field. The free cyclobutadiene and its derivatives are extremely labile and therefore they can't be used directly in the synthesis of complexes. All of the currently known synthetic methods for cyclobutadiene complexes involves indirect methods like from halocyclobutenes and photo α -pyrones (scheme-1) [5,6]. We have been successful in the synthesis of stable DADB and its complexes with irradiated Tungsten hexa-carbonyl in THF directly (scheme-2).