

NOTE**Reactions of Hexaphenyldilead with Bifunctional Tetradentate Schiff Bases**

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The reactions of hexaphenyldilead with bifunctional tetradentate Schiff bases in 1:1 molar ratio were studied in anhydrous benzene. Complexes of the type $[R_3Pb]_2-S'B'$ (where $R = -C_6H_5$ and $S'B'$ is Schiff base) have been synthesized. All the reactions were found to be quite facile and lead-lead bond was found to be cleaved in preference to the lead-carbon bond. The resulting derivatives of organolead(IV) were obtained in the form of yellow solids. They were quite stable in air and are not easily attacked by moisture. They are soluble in DMF and DMSO. The molar conductance values in DMSO were found to be below $5 \text{ ohm}^{-1} \text{ cm}^{-2} \text{ mol}^{-1}$ indicating the absence of any ionic species. In these complexes, the lead atom probably acquires coordination number of 5 and exhibits trigonal bipyramidal configuration.

Key Words: Hexaphenyldilead, Tetradentate Schiff bases.

In recent years, there has been a growing interest in the study of lead(IV) complexes with nitrogen and oxygen donor ligands. A number of complexes of organolead compounds with chelating ligands such as dithiozone, acetylacetone, 8-hydroxyquinoline and 1-(2-pyridylazo)-2-naphthol¹⁻⁴ have been reported.

Several workers^{5,6} reported a number of nitrogen-bonded heterocyclic lead compounds such as N-(triethyllead)imidazole. A large number of coordination compounds of organolead halides and carboxylates have been reported with such ligands as pyridine, 1,10-phenanthroline, 2,2'-bipyridine, hexamethylphosphoramide, dimethylsulfoxide, dimethyl formamide, tetramethylammonium chloride, tetraethylene sulfoxide and dimethylacetamide⁷⁻¹¹. A survey of literature revealed that there is probably no report on the studies of the reactivity of lead-lead bond by using bifunctional tetradentate Schiff bases.

In the present investigations, the reactivity of lead-lead bond was studied by using bifunctional tetradentate Schiff bases.

Bifunctional tetradentate Schiff bases were prepared by the condensation of two moles of salicylaldehyde, *o*-hydroxyacetophenone or benzoyl acetone with one mole of diamine in absolute alcohol. The contents were refluxed on a water bath for 2 to 3 h. On cooling fine crystals were obtained. The Schiff bases were further purified by recrystallization. A micro-analysis (except metal) of compounds

was carried out at Central Drug Research Institute, Lucknow. Molecular weight was determined with the help of semi-micro ebulliometer. Infrared spectral studies were carried out in a range of 4000-400 cm^{-1} or 250 cm^{-1} . The data have been given in the Tables 1-3.

TABLE-1
PHYSICAL PROPERTIES OF LEAD(IV) DERIVATIVES OF
BIS-SALICYLALDEHYDE-DIIMINES

S.No.	Compound / m.f.	Color/State	m.p. ($^{\circ}\text{C}$)	Yield (%)	ν_{max} , cm^{-1}	
					Pb-O	Pb-N
1	$[(\text{C}_6\text{H}_5)_3\text{Pb}]_2/(\text{C}_{16}\text{H}_{14}\text{N}_2\text{O}_2)$	Yellow/Solid	237-240, decomp.	78	475 m	500 vs
2*	$[(\text{C}_6\text{H}_5)_3\text{Pb}]_2/(\text{C}_{17}\text{H}_{16}\text{N}_2\text{O}_2)$	Yellow/Solid	236-238, decomp.	77	475 m	510 s
3**	$[(\text{C}_6\text{H}_5)_3\text{Pb}]_2/(\text{C}_{17}\text{H}_{16}\text{N}_2\text{O}_2)$	Yellow/Solid	235-237, decomp.	84	480 m	505 s
4	$[(\text{C}_6\text{H}_5)_3\text{Pb}]_2/(\text{C}_{20}\text{H}_{14}\text{N}_2\text{O}_2)$	Yellow/Solid	247-250	82	475 m	500 s

*N,N'-1,2-Propylene *bis*(salicylaldimine), **N,N'-1,3-Propylene *bis*(salicylaldimine).

TABLE-2
PHYSICAL PROPERTIES OF LEAD(IV) DERIVATIVES OF
bis-o-HYDROXY-ACETOPHENONE-DIIMINES

S. No.	Compound / m.f.	Color/State	m.p. ($^{\circ}\text{C}$)	Yield (%)	ν_{max} , cm^{-1}	
					Pb-O	Pb-N
1	$[(\text{C}_6\text{H}_5)_3\text{Pb}]_2/(\text{C}_{18}\text{H}_{18}\text{N}_2\text{O}_2)$	Yellow/Solid	237-239, decomp.	82	475 m	520 s
2	$[(\text{C}_6\text{H}_5)_3\text{Pb}]_2/(\text{C}_{19}\text{H}_{20}\text{N}_2\text{O}_2)$	Dark yellow/Solid	238, decomp.	85	480 m	515 s

TABLE-3
PHYSICAL PROPERTIES OF LEAD(IV) DERIVATIVES OF
BIS-BENZOYLACETONE-DIIMINES

S. No.	Compound / m.f.	Color/State	m.p. ($^{\circ}\text{C}$)	Yield (%)	ν_{max} , cm^{-1}	
					Pb-O	Pb-N
1	$[(\text{C}_6\text{H}_5)_3\text{Pb}]_2/(\text{C}_{22}\text{H}_{22}\text{N}_2\text{O}_2)$	Yellow/Solid	235-237, decomp.	72	470 m	524 s
2	$[(\text{C}_6\text{H}_5)_3\text{Pb}]_2/(\text{C}_{23}\text{H}_{24}\text{N}_2\text{O}_2)$	Yellow/Solid	230-237, decomp.	75	476 m	527 s

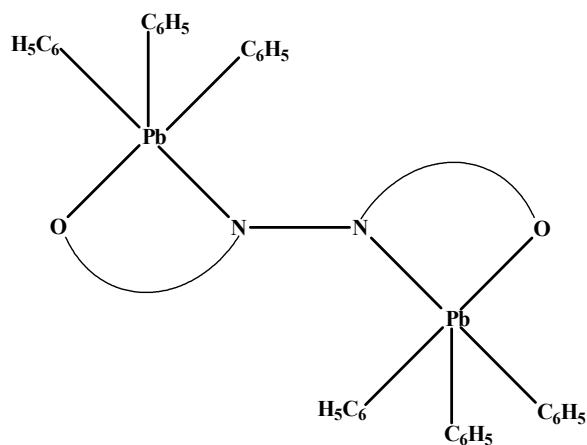
The reactions of hexaphenyldilead with bifunctional tetradentate Schiff bases in 1:1 molar ratio were studied in anhydrous benzene. The reactions can be represented by the following general equation:



All the reactions were found to be quite facile. It has been observed that lead-lead bond was cleaved in preference to the lead-carbon bond in these reactions.

The resulting derivatives of organolead(IV) have been obtained in the form of yellow solids. They are quite stable in air and are not easily attacked by moisture. They are soluble in DMF and DMSO. The molar conductance values in DMSO were found to be below 5 $\text{ohm}^{-1} \text{cm}^{-2} \text{mol}^{-1}$ indicating the absence of any ionic species.

In these complexes, the lead atom probably acquires coordination number of 5 and have trigonal bipyramidal structure. On the basis of the elemental analyses of 1:1 products, the following structure can be postulated:



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