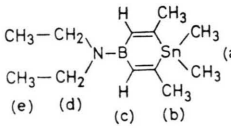
2 stellt somit eine interessante Modellverbindung zum Studium relativer Reaktionsgeschwindigkeit dar. Über derartige Untersuchungen sowie über Versuche, Si, N, P, As, S und Übergangsmetalle an und in den Ring zu binden, über Substitutionen an der BN- und BC-Bindung von **2** sowie über seine Redoxeigenschaften berichten wir nach Abschluß laufender Untersuchungen.

Experimentelles

Zu 5,4 g (33,5 mMol) **1** in 25 ml Hexan fügte man 50 mg Azodiisobutyronitril und danach tropfenweise unter Rühren eine Lösung von 7,2 g (47 mMol) $(CH_3)_2SnH_2$ in 10 ml Hexan. Nach vierstündigem Kochen unter Rückfluß ergab die fraktionierte Destillation 1,25 g (25%) **1** vom Sdp. 67 °C/0,1 Torr, 2,9 g (28%) **2** vom Sdp. 91–95 °C/0,1 Torr sowie eine hochsiedende Fraktion[9] ^{1}H–NMR (5-proz. in C_6H_6 gegen iTMS):



a) –0,15 ppm, $^2J_{SnCH_3}$ 55 Hz
b) –2,19 ppm, $^3J_{SnCCH_3}$ 47 Hz
c) –6,85 ppm, $^4J_{HCCCH_3}$ 1,5 Hz
d) –3,17 ppm, (Quartett)
e) –0,87 ppm, (Triplett)

$C_{12}H_{21}BNSn$(311,83)
Ber.: C 46,42 H 7,76 N 4,49,
Gef.: C 47,01 H 7,55 N 4,51.

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Magnetic Studies on Schiff Base Complexes of Al(III) and Si(IV)

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Schiff bases, Aluminium complexes, Silicon complexes, Magnetic susceptibility

The magnetic susceptibilities of some newly synthesized Al(III) and Si(IV) complexes of Schiff bases derived from the condensation of *o*-hydroxyacetophenone or 2-hydroxy-1-naphthaldehyde with hydroxyalkylamines or diamines have been measured and the data indicate their diamagnetic character.

Magnetic studies on Schiff base complexes are largely confined to transition metals such as V(IV), Mn(II), Co(II), Ni(II), Cu(II), Fe(III) etc.[1–4]. However, such properties of Schiff base complexes of non-transition elements have not been studied extensively. Kogan *et al.*[5] measured the magnetic susceptibilities of Sn(IV) complexes of aromatic Schiff bases and found them to be diamagnetic. No reference concerning the magnetic behaviour of Al(III) and Si(IV) complexes of Schiff bases appears to have been cited in the literature. In view of this and in order to have an idea about the magnetic properties of Schiff base complexes of non-transition elements, we have synthesized a series of complexes of Al(III) by the reactions of aluminium isopropoxide and of Si(IV) by the reactions of silicon tetraacetate with the Schiff bases in different stoichiometric ratios. The details of their syntheses, molecular association and IR spectral studies have already been reported[6–9] and in the present paper the magnetic properties of a few representative complexes of Al(III) and Si(IV) with bifunctional tridentate and tetradentate Schiff bases derived from the condensation of *o*-hydroxyacetophenone or 2-hydroxy-1-naphthaldehyde with hydroxyalkylamines or diamines are described.

The magnetic susceptibilities were determined by Gouy method[10] at room temperature (38 ± 1 °C) using aqueous nickel chloride solution as calibrant.

The specific magnetic susceptibilities (χ_S) of dialuminium tris-Schiff base complexes range from -0.5584 to $-0.6070 \cdot 10^{-6}$ cgs units and indicate their diamagnetic character. Similar complexes of Ga(III)[11] of the type Ga_2L_3 (where H_2L

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Table I. Magnetic susceptibilities of aluminium SCHIFF base complexes.

Complex	$-\chi_S \cdot 10^{-6}$ [cgs]	$-\chi_M \cdot 10^{-6}$ [cgs]
$Al_2[OC_6H_4(CH_3):NCH_2CH(CH_3)O]_3$	0.5584	350.7
$Al_2[OC_6H_4C(CH_3):NC(CH_3)_2CH_2O]_3$	0.5830	390.3
$Al_2[OC_6H_4C(CH_3):NCH(C_2H_5)CH_2O]_3$	0.5775	386.6
$Al_2[OC_6H_4C(CH_3):NCH_2CH_2N:C(CH_3)C_6H_4O]_3$*	0.6070	—
$Al_2[OC_6H_4C(CH_3):NCH_2CH_2CH_2N:C(CH_3)C_6H_4O]_3$	0.5964	583.5

* Being insoluble in benzene, the molecular weight could not be determined.

Table II. Magnetic susceptibilities of silicon SCHIFF base complexes.

Complex	$-\chi_S \cdot 10^{-6}$ [cgs]	$-\chi_M \cdot 10^{-6}$ [cgs]
$Si[OC_6H_4C(CH_3):NCH_2CH(CH_3)O]_2$	0.6551	268.7
$Si[OC_{10}H_6CH:NCH_2CH_2O]_2$	0.4475	203.2
$Si[OC_{10}H_6CH:NCH_2CH(CH_3)O]_2$*	0.4925	—
$Si[OC_{10}H_6CH:NCH_2CH_2CH_2O]_2$	0.4789	231.0
$Si[OC_{10}H_6CH:NC(CH_3)_2CH_2O]_2$	0.5240	267.4

* Being insoluble in benzene, the molecular weight could not be determined.

represents the bifunctional tridentate or tetradentate Schiff base of *o*-hydroxyacetophenone or 2-hydroxy-1-naphthaldehyde) have also been found to be diamagnetic but these have lower χ_S values (ranging from -0.3791 to $-0.5343 \cdot 10^{-6}$ cgs units) as compared to aluminium complexes. The molecular magnetic susceptibilities (χ_M) of the complexes soluble in benzene were calculated by multiplying the χ_S values by the molecular weights of the complexes, which were determined ebullioscopically in benzene[6,7]. The χ_S and χ_M values of Al_2L_3 type of complexes are recorded in Table I. The magnetic susceptibilities of isopropoxy aluminium Schiff base complexes could not be determined due to their readily hydrolysable nature.

In Table II are given the χ_S and χ_M values for the silicon bis-Schiff base complexes. The specific magnetic susceptibility values range from -0.4475 to $-0.6651 \cdot 10^{-6}$ cgs units, which indicate that the silicon complexes are also diamagnetic. Similarly, bis-Schiff base complexes of Ti(IV) and Sn(IV)[5] of the composition $TiCl_4 \cdot L_2$ and $SnCl_4 \cdot L_2$ (where L represents the molecule of aromatic Schiff base of benzaldehyde or salicylaldehyde) have also been reported to be diamagnetic. The acetoxy silicon Schiff base complexes are extremely sensitive to moisture and hence their magnetic susceptibilities could not be determined.

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