

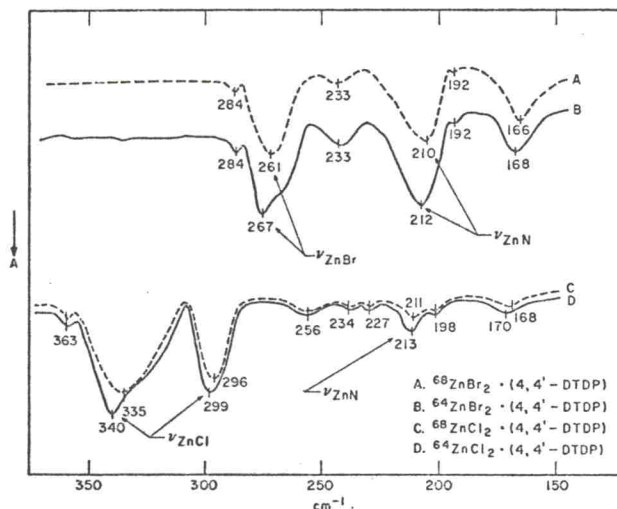


Fig. 2. Infrared spectra in the region 350–150 cm^{-1} for the isotopic $\text{ZnCl}_2 \cdot (4,4'\text{-DTDP})$ and $\text{ZnBr}_2 \cdot (4,4'\text{-DTDP})$ complexes.

Table 4. Observed frequencies (cm^{-1}), isotopic shifts, and band assignments for $\text{ZnCl}_2 \cdot (4,4'\text{-DTDP})$

$4,4'\text{-DTDP}$	$^{\text{NA}}\text{ZnCl}_2 \cdot (4,4'\text{-DTDP})$	$^{64}\text{ZnCl}_2 \cdot (4,4'\text{-DTDP})$	$^{68}\text{ZnCl}_2 \cdot (4,4'\text{-DTDP})$	$\bar{\nu}(^{64}\text{Zn}) - \bar{\nu}(^{68}\text{Zn})$	Assignments
533(s, sp)	551(vvw)	549	549	0	Ligand and ligand induced
		536	—	—	
500(sh)	499(s, sp)	498	498	0	
488(s, sp)	486(s, sp)	485	486	-1	
438(m)	446(w)	445	445	0	
414(m)	409(vvw)	409	409	0	$\nu\text{ZnCl}_{\text{asym}}$
379(w)	363(vw)	363	363	0	
343(vw)	341(s)	340	335	5	
281(vvw)	299(s)	299	296	3	$\nu\text{ZnCl}_{\text{sym}}$
	256(m)	256	256	0	
	235(w)	234	234	0	
		227	227	0	Ligand induced
183(vvw)	213(m)	213	211	2	
	199(vvw)	198	198	0	
	170(m)	170	168	2	Ligand
	154(vvw, br)				
	113(m)	114	112	2	Lattice

Abbreviations: s = strong; sp = sharp; m = medium; w = weak; v = very; sh = shoulder; br = broad.

$4,4'\text{-DTDP}$, $^{\text{NA}}\text{ZnCl}_2 \cdot (4,4'\text{-DTDP})$, $^{\text{NA}}\text{ZnBr}_2 \cdot (4,4'\text{-DTDP})$, and for the zinc complexes containing the zinc isotopes of mass 64 and 68.

For the $\text{ZnCl}_2 \cdot (4,4'\text{-DTDP})$ complex it was observed that the 341 and 299 cm^{-1} absorptions are metal and halogen sensitive. For the $\text{ZnBr}_2 \cdot (4,4'\text{-DTDP})$ complex the 264 cm^{-1} absorption is also metal- and halogen-sensitive. Thus, these bands may be assigned as metal-halogen stretching vibrations. These vibrations occur in a region normal for terminal zinc-halogen stretching modes associated with a tetrahedral environment for the zinc atom [28]. The band at $\sim 212 \text{ cm}^{-1}$ in both the chloride and bromide is sensitive only to metal and may be assigned as the metal-nitrogen stretching vibration.

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as the $\nu_{\text{ZnCl}_{\text{sym}}}$
with pressure.
lattice mode,
signments for

200 cm^{-1} are
OP(indicating
des. The fre-
brations asso-
The 223 cm^{-1}
is the metal-
 m^{-1} band de-
and must be
by pressure.

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configuration
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e results very
ccurred to the
pic zinc halide
ency data for

es

$\text{Zn} \cdot (4,4'\text{-DTDP})$

546(s)
505(vw)
493(vw)
466(m)
446(w)
385(vw)
363(vw)
299(vw)
285(m)
255(m)
230(vw)
215(m)
190(s)
162(w)
137(sh)

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