

### Ferrous Trisbipyridyl Chloride and Azide

$\text{Fe}(\text{bipy})_3\text{Cl}_2 \cdot 5\text{H}_2\text{O}$  and  $\text{Fe}(\text{bipy})_3(\text{N}_3)_2 \cdot 5\text{H}_2\text{O}$  are low-spin compounds at room temperature and 1 atm. Under pressure one observes a low- to high-spin ground state change in both compounds. A comparison of the conversion from the low-spin state with pressure at 298°K for these trisbipyridyl compounds and conversion of a typical low-spin trisphenanthroline compound is presented in Fig. 21. The low-spin ferrous species in the trisbipyridyl chloride decreases from 88% at 40 kbar to about 79% at 150 kbar. The trisbipyridyl azide exhibits a nearly constant amount of low-spin species (86%–87%) over the range of 60–150 kbar. In general, the trisbipyridyl compounds exhibit less low-spin to high-spin conversion (Fig. 21) than the trisphenanthroline compounds.

### Ferrous Bisbipyridyl Oxalate

Ferrous bisbipyridyl oxalate,  $\text{Fe}(\text{bipy})_2(\text{C}_2\text{O}_4) \cdot 3\text{H}_2\text{O}$ , is an intermediate-spin compound according to magnetic measurements made by König and Madeja.<sup>9</sup> It is analogous to the bisphenanthroline oxalate discussed previously. A change from an intermediate-spin ground state to one of high spin is reflected in Fig. 22 which presents 298°K and 383°K isotherms for the bisbipyridyl oxalate. The higher conversion with pressure to the high-spin state expected for an intermediate-spin compound is observed. Also the thermal enhancement of the high-spin state at elevated temperature is again observed. The amount of conversion from the intermediate-spin ground state

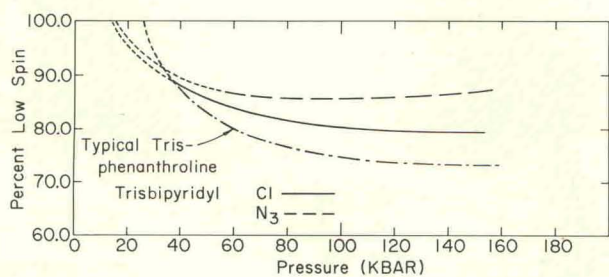


FIG. 21. Percent low-spin Fe(II) vs pressure, trisbipyridyl chloride and azide.

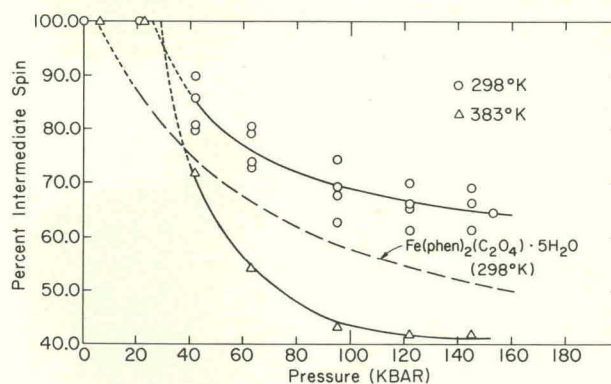


FIG. 22. Percent intermediate-spin Fe(II) vs pressure,  $\text{Fe}(\text{bipy})_2(\text{C}_2\text{O}_4) \cdot 3\text{H}_2\text{O}$ .

to a high-spin ground state is less for the bipyridyl oxalate than for the phenanthroline oxalate for corresponding isotherms, as is shown in Fig. 22.

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