

STUDY OF THE DEPENDENCE OF MÖSSBAUER PARAMETERS  
ON THE OUTER CATION IN NITROPRUSSIDES

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The Mössbauer spectra of 29 nitroprussides have been measured and the parameters  $\delta$  and  $\Delta$  correlated with the polarizing power  $Z/r^2$  of the outer cations. There is no overall correlation but there are limited groups in which a trend can be ascertained. In isoelectronic sequences such as  $\text{Li}^+$ ,  $\text{Be}^{2+}$ ;  $\text{Mn}^{2+}$ ,  $\text{Fe}^{3+}$ , where the outer electronic shell remains fixed, while  $Z/r^2$  increases, a definite trend of decreasing  $\delta$  and  $\Delta$  with increasing  $Z/r^2$  is observed.

## INTRODUCTION

The bonding between the ligands and the central cation in complex cyanometallate anions has been extensively studied, theoretically and spectroscopically. In hexacyanoferrates the CN ligands contribute  $\sigma$  electron density to the Fe cation, while the latter releases electron density from the  $T_{2g}$  level to the  $\pi^*$  orbitals of CN, called  $\pi$ -back-donation<sup>1,2</sup>. The outer cations associated to the complex anion also interact with the CN ligands through the N end. These interactions are weaker than those of the central Fe cation with the C end<sup>2-4</sup>.