

THE EFFECTS OF TEMPERATURE AND ANIONIC CHANGES  
ON THE LOW ENERGY INTERVALANCE CHARGE TRANSFER  
IN BERLIN GREEN

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The partial oxidation of low spin Fe<sup>2+</sup> ion to low Fe<sup>3+</sup> ions in Prussian Blue Fe<sub>3</sub>(Fe(CN)<sub>6</sub>)<sub>2</sub>·nH<sub>2</sub>O yields Berlin Green<sup>1,2</sup>. This compound supported on alkali halide matrix takes variety of colours on heating. The colour is dependent on the nature of the halide anion of the matrix and the temperature.

Absorption spectrum of Berlin Green in these matrices shows an intervalance band that shifts to low wavelengths on heating. The intervalance band being the transition of an electron from Fe<sup>2+</sup> ion to Fe<sup>3+</sup> ion in the Berlin Green lattice.

Thermo gravimetric analysis and Differential Thermal analysis of Berlin Green show an endothermic reaction at 110° C with a continuous loss in weight.

The above observations indicate the presence of two types of water of crystallization in Berlin Green.

The shift of the intervalance band can be explained on the variations in the coulombic destabilization energy, expanded on transferring an electron from a 'carbon hole' to a 'nitrogen hole' in the electrostatic fields of all the ions in the Berlin Green lattice.

*References*

- Itaya K. and Uchida I. (1986) *Inorg.Chem* 25; 389  
Robin M.B. (1962) *Inorg.Chem* 1; 337

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