

## BAND STRUCTURE OF SUPERCONDUCTING CHARGE TRANSFER SALTS

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Superconductivity has now been observed in a large number of 2:1 salts of chalcogenafulvalene-derived organic donors, primarily TMTSF,<sup>1</sup> but also more recently the sulfur-containing complex BEDT-TTF.<sup>2</sup> Besides superconductivity, these compounds exhibit a wide range of other condensed matter phenomena arising from their low dimensionality. Broadly speaking, the energy band description of their electronic properties can be divided into two distinct categories. At high temperature, the metallic state of all compounds is characterized by an open, quasi-planar Fermi surface of transfer integral anisotropy  $t_{\parallel}/t_{\perp} \approx 10$  as determined by tight-binding calculations. These calculations yield values of  $t_{\perp} \approx 30$  meV, large enough to preclude quasi-one-dimensional fluctuations over any significant temperature range, but still small enough to permit nesting of major portions of the Fermi surface. However, at low temperature and high pressure, the experimental evidence suggests that two-dimensional interactions dominate, yet  $t_{\perp}$  between cation molecules seems insufficiently volume sensitive to cause drastic changes in the Fermi topology. We propose that in this latter regime, the intrinsic interchain interaction becomes more directly involved via symmetry breaking of the high temperature band structure due to antiferromagnetic and/or anion ordering. We discuss several models pertinent to known low temperature symmetries which are consistent with observed experimental properties. For those materials whose low temperature symmetries are not yet known, we make specific predictions based on our models and existing experimental data.

<sup>1</sup>D. Jerome, A. Mazaud, M. Ribault and K. Bechgaard, *J. de Phys.* **41**, L95 (1980).

<sup>2</sup>S. S. P. Parkin, et al., *Phys. Rev. Letters* (submitted).