we have attempted to reproduce the intrinsic transport properties of the organic salt. We shall present measurements of electrical resistivity and thermoelectric power on samples prepared in at least two laboratories, and shall also discuss methods to enhance the reproducibility among crystals.

[1] FERRARIS J.P., COWAN D.O., WALATKA V. and PERLSTEIN J.H., *J. Am. Chem. Soc.* 95, 948 (1973).

[2] COLEMAN L.B., COHEN M.J., SANDMAN D.J., YAMAGISHI F.G., GARITO A.F. and HEEGER A.J., (to be published in Solid State Communications).

4. OPTICAL REFLECTIVITY OF TTF–TCNQ

P.M. Grant, G. Castro and R.L. Greene, IBM Research Laboratory, San Jose, California.

The polarized reflectivity of single crystals of TTF–TCNQ has been measured between 0.2 μm and 20 μm at room temperature, and between 0.8 μm and 2 μm at temperatures down to 20° K. Metallic like reflectivity is observed for light polarized parallel to the conducting axis, insulating behavior for the perpendicular polarization. Behavior suggestive of a plasma edge is observed at all temperatures near 1.4 μ (0.9 eV). A Drude analysis of the spectrum yields a plasma frequency of $\omega_p = 1.38$ eV, a scattering time $\tau = 2.3 \times 10^{-15}$ sec and a background dielectric constant $\epsilon_0 = 3.3$. These values are remarkably insensitive to temperature, even near the metal–insulator transition ($T \sim 60°$ K). From ω_0 and τ the optical conductivity, optical effective mass and dimensionless electron–phonon coupling constant are found to be $\sigma_{opt} = 900\,\Omega^{-1}\,cm^{-1}$, $m^*_{opt} = 1.7 m_e$, $\lambda \simeq 1.8$. The approximations involved in deriving these values and their relation to the recently proposed Peierls distortion and paraconductivity in TTF–TCNQ will be discussed.

5. INFRARED AND FAR-INFRARED ABSORPTION IN (TTF) (TCNQ)

J.B. Torrance, B.A. Scott, D.C. Green and P. Chaudhart, IBM Research, and D.F. Nicoli, Harvard University.

We have measured the infrared and far-infrared absorption spectrum of powders and films of (TTF) (TCNQ) at emperaturest above and below the metal-semiconductor transition at 58° K. At all temperatures there is a broad and extremely intense ($\alpha > 10^4$ cm^{-1}) absorption band centered at ~ 2800 cm^{-1} (~ 35 eV), which is polarized along the conducting axis. We identify this absorption as the 'charge transfer band', which is associated with *intra*-band transitions, i.e. within the lowest occupied bands of both TCNQ and TTF. In addition, preliminary far-infrared results are reported which indicate a gap considerably lower than the conductivity gap. We with to point out and emphasize that our results do *not* agree with the predictions of a simple one–electron model for the Peierls transition. It is necessary to consider electron correlation effects and to regard this absorption as due to the excitation of *correlated* electron–hole pairs. In fact, we would estimate $U \sim 0.35$ eV compared to $t \sim 0.1$ eV. The implication of our results for the nature of both the transition at 58° K and the conductivity will also be discussed.

6. CONDUCTIVITY, SUPERCONDUCTIVITY AND THE PEIERLS INSTABILITY.*

B.R. Patton† and L.J. Sham, Univ. of Calif., San Diego.

The properties of a one-dimensional model of the electron–phonon system which exhibits the Peierls instability are investigated. The instability tends to

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suppress BCS pairing and
below the structural trans
results of the conductivit
favorably with recent mea
of TTF–TCNQ but cannc
conductivity peaks found

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GH 37719.

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Mass. 02139.

7. THEORY OF F
PSEUDO-ONE-
J. Bardeen, Uni

Provided that the re
processes is sufficiently
conductivity associated
pseudo-one-dimensional
tude appears to be far to
anomalously high values
Heeger *et al.* for a few s