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Frequency Dependence of The Conductivity and Dielectric Constant of $\text{Ch}(\text{IrCl}_6)_y$ and $\text{Ch}(\text{I})_y$

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FREQUENCY DEPENDENCE OF THE CONDUCTIVITY AND
DIELECTRIC CONSTANT OF $\text{CH}(\text{IrCl}_6)_y$ and $\text{CH}(\text{I})_y$

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Abstract. We have measured the ac properties of polyacetylene doped with $\text{H}_2\text{IrCl}_6 \cdot 6\text{H}_2\text{O}$ and I_2 from 10^5 to 10^7 Hz at room temperature. We find in both cases that the conductivity is only weakly dependent on frequency, in agreement with previous work.^{1,2} However, we find that the dielectric constant of $\text{CH}(\text{IrCl}_6)_y$ is anomalously large $\sim 10^4$. We suggest that the large dielectric constant can be modeled by an effective medium theory assuming that the $\text{CH}(\text{IrCl}_6)_y$ is a mixture of conducting and insulating regions. TEM evidence in support of the model will be presented. The results of $\text{CH}(\text{IrCl}_6)_y$ will be contrasted with $\text{CH}(\text{I})_y$ where TEM evidence shows a uniform distribution of dopant in the polyacetylene and the dielectric constant is significantly lower.

¹P.M. Grant and M. Krounbi, *Sol. Stat. Comm.*, **36**, 291 (1980).

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