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Frequency Dependence of The Conductivity and Dielectric Constant of $Ch(IrCl_6)_Y$ and $Ch(I)_Y$

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FREQUENCY DEPENDENCE OF THE CONDUCTIVITY AND DIELECTRIC CONSTANT OF $CH(IrCl_6)_y$ and $CH(I)_y$

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Abstract. We have measured the ac properties of polyacetylene doped with $H_2IrCl_6 \cdot 6H_2O$ 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 $CH(IrCl_6)_y$ is anomalously large $\sim 10^4$. We suggest that the large dielectric constant can be modeled by an effective medium theory assuming that the $CH(IrCl_6)_y$ is a mixture of conducting and insulating regions. TEM evidence in support of the model will be presented. The results of $CH(IrCl_6)_y$ will be contrasted with $CH(I)_y$ where TEM evidence shows a uniform distribution of dopant in the polyacetylene and the dielectric constant is significantly lower.

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