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Charge Disproportionation without Charge Ordering in Organic Conductors
KAZUYOSHI YOSHIMI, College of Liberal Arts and Sciences, Tokyo Medical and Dental University, TAKEO KATO, HIDEAKI MAEBASHI, Institute for Solid State Physics, University of Tokyo — Based on a study of a 3/4-filled extended Hubbard model with an inter-site Coulomb interaction, we show that charge disproportionation is self-generated in the presence of strong charge fluctuations even if there is no charge ordering. In the absence of a frustrating Coulomb interaction, the extended Hubbard model is found to be unstable to phase separation into electron-rich and electron-poor metallic phases near its charge-ordering transition point. By switching on the frustrating Coulomb interaction, this phase separation is transformed into exotic disproportionation such as a stripe glass or a mosaic studied with mesoscale charged droplets. Such disproportionation is a possible origin of extremely slow charge dynamics observed in θ-type BEDT-TTF organic conductors [1,2]. [1] R. Chiba, et al. Phys. Rev. Lett 93, 216405 (2004). [2] R. Chiba, et al. Phys. Rev. B 77, 115113 (2008).

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