Rapid Communication

Unusual mechanism for the short-range electron transfer within gold–alkanethiol–ionic-liquid films of subnanometer thickness

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ABSTRACT

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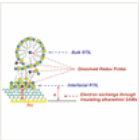
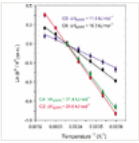
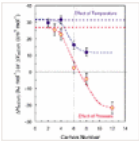
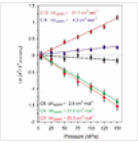
ABSTRACT

Exploiting nanoscopically tunable composite gold–alkanethiol–ionic-liquid/ferrocene self-assembled systems with tunable electron transfer distance, we discovered in the case of thinner alkanethiol films a thermally activated electron transfer pattern totally controlled by the viscosity-related slow relaxation mode(s) of the ionic liquid acting as the reactant's fluctuating environment. This pattern manifested through the activation enthalpy and volume parameters that are identical to those for viscous flow was explained in terms of the extreme adiabatic mechanism with a vanishing Marcus barrier (via the exponential Franck-Condon-like term approaching unity).

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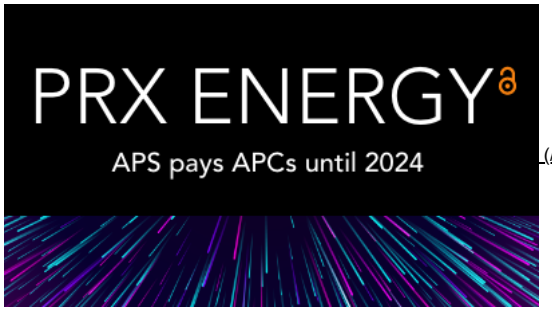

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