

LENGTH DEPENDENCE OF THE THERMALLY
ACTIVATED INELASTIC AND ELASTIC TUNNEL
CURRENT THROUGH A MOLECULAR WIRE

E. G. Petrov, V. I. Teslenko, Ya. R. Zelinskyi

Bogolyubov Institute for Theoretical Physics,
Nat. Acad. Sci. of Ukraine
(14b, Metrolohichna Str., Kyiv 03143, Ukraine)

S u m m a r y

A theoretical model of formation of the combined elastic and inelastic interelectrode current through a regular molecular wire is proposed in the case where terminal sites of the wire play a role of donor and acceptor centers. It is shown that the current is formed with two alternative mechanisms, superexchange and sequential ones. But, such an additivity is true if only a definite relation between the elementary rate constants specifying the transitions within a common system “electrode–molecular wire–electrode”, exists. The analytic dependence of the current on the number of wire units is derived.