

ELE-PO-01 The electrocatalytic cleavage of carbon-halide bonds on Ag and Au in protic solvents

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In the last years we have showed in detail how the electrocatalytic cleavage of carbon-halide bonds is modulated by (a) the stepwise or concerted nature of the DET mechanism, (as a function of the electrode surface, of the nature of the halogen atom, and of the molecular structure of RX) and (b) the double layer structure (as a function of the nature and bulkiness of the supporting electrolyte ions). To both complete and support our interpretative scheme we are now concentrating on the solvent role.

Comparing aprotic with protic organic solvents after appropriate intersolvental normalization, interesting peculiarities emerge concerning protic media. Solvent proticity deeply affects both the reaction mechanism (on both non-catalytic and catalytic electrode surfaces) and the extent of the catalytic effects. We will discuss these items on the basis of a complete investigation carried out with a carefully controlled experimental protocol on two chloride and bromide couples, one aromatic and one aliphatic (representative of stepwise and concerted mechanism, respectively), in eight solvents, four of them aprotic and four protic, on the non-catalytic GC electrode and the catalytic Ag and Au ones. The results will be also discussed in the frame of our recently developed interpretative scheme of the carbon-halide cleavage mechanism.