Spectroelectrochemical Investigation of Pentacarbonyl(pyrazine)metal(0) (Metal = Cr, Mo, W) Complexes of Group 6 Elements

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The electrochemical behaviour of pentacarbonyl(pyrazine)metal(0) complexes of the group 6 elements was studied by cyclic voltammetry in dichloromethane-\((n\text{-}Bu)_4\text{NBF}_4\) solvent-electrolyte couple at \(-20^\circ\text{C}\) vs. Ag/Ag\(^+\) or SCE reference electrode. Constant potential electrolyses of the complexes were carried out at their first oxidation peak potentials and monitored \textit{in situ} by UV-Vis spectrometry. Electrolysis of W(CO)\(_5\)pz produces [W(CO)\(_5\)pz]\(^+\) and a similar electrochemical mechanism is expected both for Cr(CO)\(_5\)pz and Mo(CO)\(_5\)pz complexes. \textit{In situ} low temperature constant current ESR electrolysis also confirmed the production of [W(CO)\(_5\)pz]\(^+\) after the electron transfer.