Voltammetric study of 7-nitro-1,4-benzodiazepin-2-ones and their acid hydrolysis products, 2-amino-5-nitrobenzophenones

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The electrochemical reduction of 7-nitro-1,4-benzodiazepin-2-ones and of their acid hydrolysis products, 2-amino-5-nitrobenzophenones, was studied by polarography and cyclic voltammetry in a solvent - buffer system containing pyridine, formic acid and tetramethylammonium chloride solution in order to elucidate the effect of the nature and position of the substituentson the reduction of the nitro group. It was found that these two types of compounds can be polarographically and voltammetrically distinguished and that their reduction mechanisms differ owing to a structural change in substituents located at a para-position relative to the nitro group. Based on polarographic and cyclic voltammetric data, reduction mechanisms for these two species are proposed in which the donor - acceptor properties of the substituents and the importance of the chemical reactions associated with the electron-transfer steps are indicated.