Pyrolyzed Photoresist Electrodes for Integration in Microfluidic Chips for Transmitter Detection from Biological Cells

In this study, we show how pyrolyzed photoresist carbon electrodes can be used for amperometric detection of potassium-induced transmitter release from large groups of neuronal PC 12 cells. This opens the way for the use of carbon film electrodes in microfabricated devices for neurochemical drug screening applications. We also investigated the effect of using two different photoresists for fabrication of pyrolyzed photoresist electrodes. We observed a significant difference in the cross-sectional profile of band electrodes made of AZ 4562 and AZ 5214 photoresist. This difference can be explained by the difference in photoresist viscosity. By adding a soft bake step to the fabrication procedure, the flatness of pyrolyzed AZ 5214 electrodes could be improved which would facilitate their integration in microfluidic chip devices.