Abstract

Diamond is a very attractive material for many potential applications due to its outstanding properties. In particular, highly boron-doped conductive diamond films prepared by CVD process have received attention from electrochemists owing to the superior electrochemical properties such as wide potential window, very low background current, chemical and physical stability. In this project, the electroanalytical application and electrolysis using conductive diamond electrodes were studied. We have demonstrated several analytical applications of high sensitive detection of biologically or environmentally important chemical species such as uric acid, glucose, and so on. Furthermore, we have applied the electrodes for electrochemical waste water treatment etc. While our project focused mainly on electroanalytical application of diamond electrodes, we also made significant contributions in understanding the reaction kinetics at various surface modified electrodes and in preparing various kinds of micro and nanostructured electrodes. In other words, we could improve this research area very much from the fundamental study to practical application of diamond electrodes.