RuO$_2$-based electrodes have been extensively studied for several electrochemical reactions. Earlier literature works claim RuO$_2$-based catalysts to be active also for the electrocatalytic conversion of CO$_2$ to methanol with high selectivity at very low overpotentials. Here we report a thorough investigation of RuO$_2$ films and particles for the electrocatalytic reduction of CO$_2$. The different experimental configurations explored in our work showed that H$_2$ is basically the only reaction product under CO$_2$ reduction conditions in contrast to earlier reports. In situ surface enhanced infrared absorption spectroscopy (SEIRAS) measurements revealed that CO bound to the RuO$_2$ surface, albeit acting solely as spectator species. Our experiments indicated that adsorbed CO cannot be reduced further to methanol or other CO$_2$ reduction products.