

Poisoning of the catalyst seems to be one of the most serious problems preventing a widespread commercialization of fuel cell technology. This thesis focuses on the effect of CO poisoning and hydrogen dilution by nitrogen on performance of fuel cells with low platinum content. Catalysts were deposited by magnetron sputtering directly on membrane etched by plasma. Alloys with different platinum-ruthenium ratio were used to mitigate the CO poisoning. We found that presence of nitrogen has almost negligible effect on the fuel cell performance. On the other hand, CO, even in small concentrations, caused a significant drop in power density. PtRu with atomic ratio 2:1 and 1:1 showed the best CO tolerance.