

Effect of ZSM-5 as proton conductor in DMFC

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Zeolite was applied as a new type of proton conductors for electro-oxidation of methanol at high temperature ($>100^{\circ}\text{C}$) in direct methanol fuel cell. High-throughput-screening (HTS) test was carried out for the fast screening of zeolites as proton conductors. The activity of methanol electro-oxidation was measured by the intensity of fluorescence and onset potential of zeolite (different Si/Al ratio of ZSM-5)-PtRu/C electrocatalysts. ZSM-5 was most promising candidate among all the above types of zeolites to facilitate the electro oxidation of methanol and we synthesis different Si/Al ratio of ZSM-5(Si/Al = 24, 50, 100). Different different Si/Al ratio of ZSM-5(Si/Al = 24, 50, 100) were mixed with commercial PtRu/C electrode to improve the performance of direct methanol fuel cell. The most active composition of the PtRu-Zeolite electrocatalysts for the electro-oxidation of methanol was in the ratio of 70 : 30 (wt%) as PtRu : zeolite (ZSM-5). PtRu/C-ZSM-5 (Si/Al=24) showed higher performance than PtRu/C-ZSM-5(Si/Al=50,100).